B.N.H.S.

PROCEEDINGS

OF THE

Bournemouth Natural Science Society.

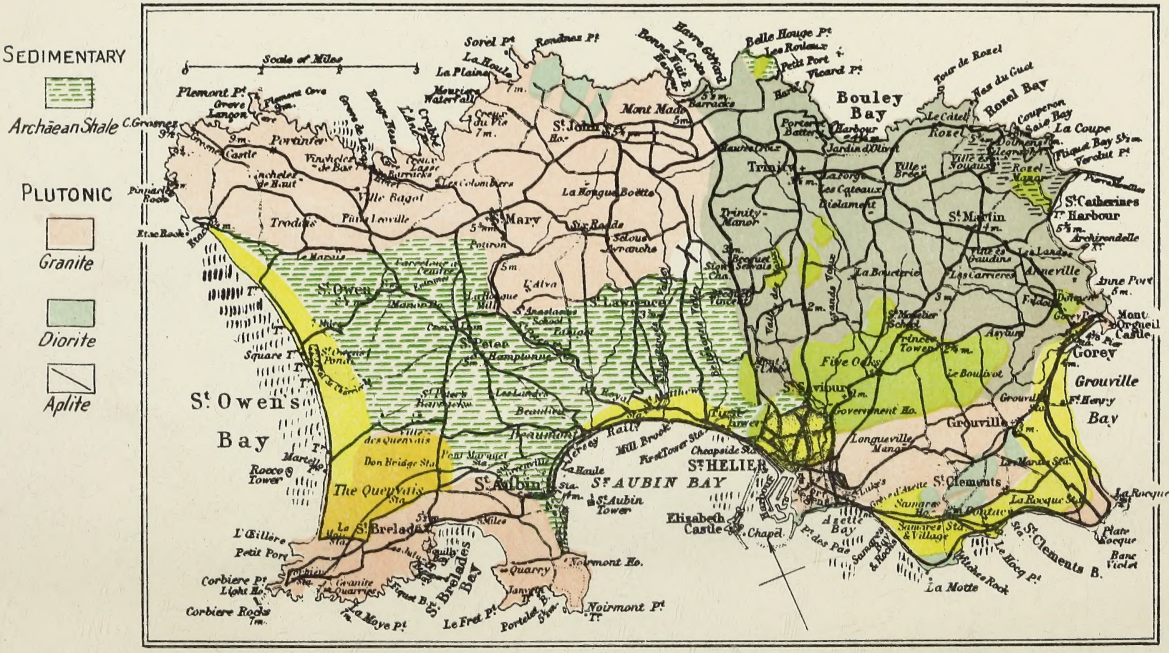
Vol. 4.

SESSION 1911-1912.

S. 18. B.

BRITISH MUSEUM
NATURAL

GEOLOGICAL MAP OF JERSEY.



PROCEEDINGS OF THE

Bournemouth Natural Science Society.

: : VOL. IV. : :

SESSION 1911-12.

PUBLISHED BY THE SOCIETY AT ITS ROOMS,
THE MUNICIPAL COLLEGE, BOURNEMOUTH, 1913.

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BRITISH MU
NATURAL

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(*By kind permission of Mr. J, Sinel*).

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Introductory.

THE BOURNEMOUTH NATURAL SCIENCE SOCIETY was founded in 1903, being the successor to an older society which was formed in 1883 and became defunct in 1897. Its objects are declared by the second of its rules to be "the promotion of the study of Science in all its branches, by means of Lectures, Field Meetings, the Reading and Discussion of Papers, and the formation of Sections of its members devoted to any particular branch of the Society's work."

The Sections at present working are seven in number:— **Archæological and Historical, Botanical, Geographical, Geological, Microscopical and Zoological, Photographical, and Physical.**

During the WINTER SESSION, from October to April, GENERAL and SECTIONAL MEETINGS are held. TWO GENERAL MEETINGS are usually held in each month, comprising Lectures and Demonstrations on various subjects of scientific interest, illustrated by lantern slides, diagrams, or specimens. These meetings are held on Saturdays at 4.30 p.m.

SECTIONAL MEETINGS are held on Thursdays and Saturdays at 4.30 p.m., each Section being allotted one monthly meeting. At these, the papers read are more specialized and technical than at the General Meetings.

During the last four years the Meetings, with very few exceptions, have been held either at Trinity Hall, Lorne Park, or at THE SOCIETY'S ROOM, GRANVILLE CHAMBERS, RICHMOND HILL.

Throughout the SUMMER SESSION, GENERAL EXCURSIONS to places of interest in the neighbourhood are arranged once in each month, usually on Wednesdays. SECTIONAL EXCURSIONS also take place, once in each week, on Wednesdays or Saturdays.

The management of the Society is vested in a Council, which is elected at the Annual General Meeting, held in October.

The Members are elected by the Council, and pay an annual subscription of Ten Shillings for full membership (admitting to all meetings and excursions for the year). Visitors to Bournemouth are permitted to join for the Winter or Summer Sessions on payment of Seven Shillings and Sixpence, if approved by the Council.

The Society is endeavouring to lay the foundations of a MUSEUM by acquiring collections of archæological, botanical, geological, zoological and other specimens of scientific interest, and a good beginning has already been made. Up to the present the existing collections have not been fully available for the inspection of members owing to the lack of the necessary accommodation for their effective display. It is, however, hoped that in the near future this will be remedied by the establishment of a MUNICIPAL MUSEUM in which the Society's collections could be suitably lodged and arranged.

A MONTHLY NOTICE, giving full particulars of all meetings, etc., is posted to every member before the beginning of each month, and a volume of Proceedings is published every year.

Application Forms for Membership, and further particulars can be obtained from the Secretaries of the Society.

T. MICHELL, M.I.C.E.,
Trewirgie, Christchurch Road,
Bournemouth
(Hon. Secretary).

R. A. DE PAIVA,
San Remo, Carysfort Road,
Bournemouth
(Assistant Hon. Secretary).

J. F. SPENCER,
Glenthorne, Richmond Park Road,
Bournemouth
(Assistant Secretary).

Bournemouth Natural Science Society.

OFFICERS AND COUNCIL FOR 1912—1913.

President:
SIR RAY LANKESTER. K.C.B., M.A., LL.D., F.R.S., F.L.S.

Vice-Presidents:
G. BROWNEN, ESQ., F.C.S.
C. E. J. CRALLAN, ESQ., M.A., M.B., M.R.C.S.
J. E. LIDDIARD, ESQ., F.R.G.S., M.N.G.S. of U.S.A., M.J.S.
REV. E. F. LINTON, M.A.
DR. W. T. ORD, F.G.S.
DR. A. RANSOME. M.A., F.R.S.
MISS C. AGNES ROOPER.
DR. J. ROBERTS THOMSON, J.P.
H. J. WADDINGTON, ESQ., F.L.S.

Chairman of Council:
SIR DANIEL MORRIS. K.C.M.G., M.A., D.SC., D.C.L., F.L.S.

Vice-Chairman of Council:
G. G. HAMILTON, ESQ., M.B., F.R.C.S. ENG.

Council:
THE OFFICERS (ex-officio) and
H. BACKHOUSE, ESQ.
J. M. FRENCH, ESQ.
G. G. HAMILTON, ESQ., M.B., F.R.C.S., ENG.
S. MCCALMONT HILL, ESQ., D.C.L.
SIR DANIEL MORRIS, K.C.M.G., M.A., F.L.S.
H. LE JEUNE. ESQ.
J. H. SCOTT, ESQ., M.E.
R. V. SHERRING, ESQ., F.L.S.

Chairmen of Sections:
Archæological and Historical: G. BROWNEN, ESQ., F.C.S.
Botanical: MISS C. AGNES ROOPER.
Geographical: G. DE CASTRO, ESQ., M.R.C.S., ENG.
Geological: DR. W. T. ORD, F.G.S.
Microscopical and Zoological: H. B. WELLS, ESQ., F.R.M.S
Photographical: G. BRUMELL, ESQ., A.R.I.B.A.
Physical: HUBERT PAINTER, ESQ., B.SC., F.C.S.

Hon. Treasurer:
G. BRUMELL. ESQ., A.R.I.B.A.

Secretaries:
Hon. Secretary: T. MICHELL, ESQ., M.I.C.E., Trewirgie, Christchurch Road, Bournemouth.
Assistant Hon. Secretary: R. A. DE PAIVA. ESQ, San Remo, Carysfort Road, Bournemouth.
Assistant Secretary: J. F. SPENCER. ESQ., Glenthorne, Richmond Park Road, Bournemouth.

Hon. Librarian:
W. MUNN RANKIN. ESQ., M.SC., B.SC.

Hon. Editor:
HUBERT PAINTER, ESQ., B.SC., F.C.S.

Hon. Auditors:
H. SUTTON, ESQ.
E. BICKER, ESQ.

Bankers:
NATIONAL PROVINCIAL BANK OF ENGLAND, BOURNEMOUTH.

PAST PRESIDENTS:

1903-4	J. E. BEALE. ESQ., Mayor of Bournemouth.
1904-5—1905-6 ..	G. E. J. CRALLAN, ESQ., M.A., M.B., M.R.C.S.
1906—1907	H. J. WADDINGTON, ESQ., F.L.S.
1907-8—1908-9 ..	DR. A. RANSOME. F.R.S.
1909-10	DR. A. SMITH WOODWARD, LL.D., F.R.S., F.L.S., F.G.S.
1910-11	DR. DUKINFIELD H. SCOTT, M.A., LL.D., F.R.S., F.G.S.
1911-12	SIR RAY LANKESTER, K.C.B., M.A., LL.D., F.R.S., F.L.S.

Annual Meeting, 1911.

THE ANNUAL MEETING for 1911 was held in the Trinity Hall, Lorne Park, Bournemouth, on Saturday, October 28th, at 4.30 p.m. The chair was taken by Sir Daniel Morris, K.C.M.G.

The Chairman, in opening the meeting, said they had certainly got through an immense amount of work during the year, and it had been the means of bringing a considerable increase in the membership. The total net increase was 101 members, bringing the total to 418. A question had been raised, he continued, whether it was advisable to go on increasing the number of members. This was a matter requiring careful consideration, but he pointed out that the society was organised into seven sections, which conveniently enabled the grouping of those interested in the several various branches and prevented overcrowding.

The minutes of the previous Annual Meeting having been read and passed, the Council's Report and the Hon. Treasurer's Statement were read, and Dr. Moorhead, after making some eulogistic remarks on the very instructive and interesting lectures during the year, and on the sound work done by the Society, proposed that the reports be adopted. This was seconded by Mr. W. H. Scott and unanimously passed.

The Council's Report showed that during the year 10 General and 29 Sectional Lectures, 9 General and 22 Sectional Excursions, and 2 Special General Meetings had been held; at all of these the attendance had been very good. It also referred to the special effort made during the year to bring before the public the desirability of establishing a Bournemouth Museum of Natural Science maintained from public funds. It strongly hoped that the Borough Authorities would at an early date see their way to appoint a Committee to carry out the provisions of the Museum Act, adopted so long ago as 1906, as it was believed it was essential to the interests of the Borough and to the progress of intellectual development and research. In conclusion, the Council thanked the donors of botanical, geological and other specimens to their collection, and those who had contributed to the success of the lectures and excursions.

Reports were read by the following Chairmen of Sections, briefly narrating the year's work done by each Section:—Archæological and Historical by Mr. G. Brownen; Botanical by Mr. G. G. Hamilton (for Miss Agnes Rooper); Geographical, Dr. G. de Castro; Geological by the Hon. Secretary (for Dr. W. T. Ord); Photographical by Mr. E. W. Barlow; Physical by Mr. H. Painter; Zoological by Dr. G. E. J. Crallan; Microscopical by Mr. H. B. Wells; and the Hon. Librarian's Report by Mr. F. I. Cooke.

Sir Daniel Morris proposed the re-election of the President, Sir E. Ray Lankester, K.C.B., F.R.S. Sir Ray, he said, was an old friend of his, and they were convinced that a more suitable President could not be found. He had already given valued services, and his further association with the society would still further promote its interests. The proposition was seconded by Mr. Backhouse, and passed with applause.

Dr. W. T. Ord was elected to be a Vice-President, on the proposition of Mr. G. G. Hamilton, who spoke in eloquent terms of his abilities and of his past services to the Society.

Mr. Whitty Chandler, in a few graceful remarks, proposed the re-election of the Council and Officers for the year. This was seconded by Dr. Shillitoe, and carried unanimously.

Sir Daniel Morris, after referring to the loss which the Society would suffer by the departure of Dr. Crallan, spoke in high terms of his generous contributions to the library, and his valued services in connection with lectures and other matters. He (the Chairman) was glad to find that Dr. Crallan would still continue to be a member and a Vice-President of the Society, and they wished him every success in his new sphere of activity.

A vote of thanks to the Hon. Auditors and a similar compliment to the Chairman concluded the business of the meeting.

Summary of Cash Account for year ending 30th September, 1912.

RECEIPTS.

	£	s.	d.
By Balance in Bank	75	8	2
,, Members' Subscriptions	166	0	6
,, Members' Subscriptions for 1913... ...	12	10	0
,, Receipts from Lectures, etc. (gross) ...	11	6	0
,, Sale of "Proceedings"	1	17	0
,, Surplus from Excursions	9	0	3
,, Mr. Sherring, for Orchid Block	1	15	9
,, Refund from Students' Association ...	3	2	0
,, Mrs. Hamilton's gift for cabinet ...	5	0	0
	£285	19	8

PAYMENTS.

	£	s.	d.
To Rent of Granville Chambers	24	5	0
,, Hire of Trinity Hall	10	0	0
,, Hire of Prince's Hall	3	3	0
,, Assistant Secretary's Salary	10	0	0
,, Caretaker's Wages	2	12	0
,, *3rd vol. of "Proceedings"	56	7	10
,, Printing and Stationery	25	1	11
,, Lantern and Accessories	12	16	10
,, Books	3	7	0
,, Lecture Expenses (except printing and hire)	16	13	0
,, Postage	17	0	0
,, Subscriptions to other Societies ...	2	1	0
,, Insurance	0	5	0
,, In connection with Collections of Specimens	5	19	5
,, In connection with Museum Movement ...	11	9	8
,, Paid out for Students' Association ...	3	2	0
,, Sundries	2	18	7
	£207	2	3
Balance at Bank	78	17	5
	£285	19	8

*In addition to the cost of £56 7s. 10d. shown above for the volume of "Proceedings," an account of £2 4s. 9d. was paid by Sir D. Morris, for the plate of Nipadites, as a contribution to the Society.

This has been audited and found correct by the Hon. Auditors, Mr. H. SUTTON and Mr. E. BICKER.

Council's Report

for the Year ending Sept. 30th, 1912.

THE Council, in submitting their Ninth Annual Report have much pleasure in stating that the past year has been one of increased activity and prosperity. It has been a record year in increase of membership, the numbers having risen from 317 to 418, a net increase of 101.

During the year meetings have been held as follows:—

Conversazione with Presidential Address.
10 General Lectures.
29 Sectional Lectures.
9 General Excursions.
22 Sectional Excursions, and
2 Special General Meetings, making a total of 73

meetings, as compared with 76 held in the previous year, the difference of 3 being due to a decrease in the Sectional Lectures. The General Lectures were as follows:—

1911.

Nov. 25th.—"A Romance of Plant Life," by Sir Daniel Morris, K.C.M.G.

Dec. 9th.—"Volcanoes, Craters, and Explosions," by Dr. Tempest Anderson, M.D., D.Sc., F.L.S., F.G.S., etc.

1912.

Jan. 13th.—"The Progress of the Panama Canal," by Dr. Vaughan Cornish, D.Sc., F.R.G.S.

Jan. 27th.—"On the History of Botany," by Mr. J. F. Rayner, F.R.H.S.

Feb. 10th.—"Snap-Shots from Umbria to the North Cape," by Dr. F. W. Giles, M.B.

Feb. 24th.—"Some of the Natural Wonders of the United States of America," by Mr. Claude Lyon.

March 9th.—"The Plants of the New Forest and Surrounding District," by the Rev. J. E. Kelsall (Rector of Milton).

March 23rd.—"Ecology, or the latest phase of Plant Geography," by the Rev. Prof. George Henslow, M.A., F.L.S., F.G.S.

April 13th.—"The Island of Jersey from a Natural Science Point of View," by Dr. G. E. J. Crallan, M.A., M.B., M.R.C.S.

April 27th.—"The Dominion of New Zealand, Geographically, Physically and Generally Described," by Mr. G. de Castro, M.R.C.S.

All of them, with one exception, were illustrated with Lantern Slides.

The General Excursions were:—

1911.

Oct. 4th.—Breamore and Downton, conducted by Mr. J. M. French.

1912

May 29th.—Cheddar Cliffs and Caves, conducted by Mr. R. V. Sherring and Mr. Le Jeune.

June 5th.—The New Forest and Somerley Park, conducted by Mr. George Brownen and Mr. Le Jeune.

June 19th.—Southampton and Hartley College, conducted by Mr. Dale, Professors Studer, E. S. Lyttel, and J. Eustice, Mr. Baldwin Wiseman, and Mr. Brownen.

July 6th.—Cerne Abbas and Minterne, conducted by Mr. Harry Pouncy.

July 27th.—Heron Court, conducted by Sir Daniel Morris, K.C.M.G., and Mr. George Brownen.

August 14th.—Bradford-on-Avon, conducted by the Rev. H. H. Winwood, M.A., F.G.S., and Mr. George Brownen.

August 28th.—Charborough Park and Badbury Rings, conducted by Mr. George Brownen.

Sept. 18th.—Salisbury Cathedral and Museum, conducted by Dr. Blackmore and Mr. George Brownen.

All the General Excursions were well attended and very successful.

The two Special General Meetings were held on February 5th, 1912, " To consider and pass the amended rules," and on March 16th, 1912, " To discuss proposals for the formation of a Bournemouth Museum of Natural Science." (Members of the general public interested were invited to attend this meeting.)

The details of the Sectional Lectures and Excursions are presented in the Sectional Reports.

The new arrangement in the appointment of Sectional Secretaries has proved entirely satisfactory. It has not only relieved the work of the General Secretaries, but it is believed that it has been the means of rendering the work of the Sections more scientific and efficient.

At the Annual Meeting held on October 28th, 1911, Sir E. Ray Lankester, K.C.B., F.R.S., was unanimously elected President, and delivered his inaugural address at the Prince's Hall, Grand Hotel, on November 11th, 1911. A report of this address will appear in the Proceedings. The Council greatly appreciate the assistance rendered by him in presiding at the Special Meeting held to discuss the proposal to start a Museum in Bournemouth and for advice and assistance on other occasions. It is also a pleasure to add that he has kindly consented to be nominated as President for the coming year.

The Council regret to report that they have lost the services of Mr. C. J. Hankinson, J.P., one of the Vice-Presidents, who has taken up his residence in London, and the resignation of the late Hon. Secretary, Sir A. Brooke-Pechell, Bart., on account of ill-health.

In deference to a general wish the rules have been revised and amended, and the new rules as they now appear in Vol. III. (pp. 22-25) were approved at a Special General Meeting held on February 5th last.

As members are aware, the Society has for a long period been engaged in laying the foundation of a Museum both for educational purposes and as an exhibition and treasury for scientific objects of

local interest. During the past year a special effort was made to bring before the public the desirability of establishing a Bournemouth Museum of Natural Science maintained from public funds. At a largely attended and very representative meeting held on March 16th, the President (Sir E. Ray Lankester) in the chair, the following resolution was unanimously adopted:—" That this representative meeting of residents in the County Borough of Bournemouth considers it highly desirable that active steps should be taken to form a Museum of Natural History and Archæology in order to bring together, classify and arrange the many valuable specimens in the possession of private individuals and the Natural Science Society, or to be acquired later, and so provide a recognised means of advancing the interests of science and the spread of sound knowledge in the community." In addition a representative Committee of leading residents was appointed to consider the best means for carrying out the objects embodied in the resolution, with power to add to their number. Lately a Deputation waited on the Borough Council and Sir Daniel Morris presented an address, a copy of which appears in the Proceedings. So far the Borough Council has not seen its way to appoint a Museum Committee to carry out the provisions of the Museum Act adopted so long ago as 1906, but it is sincerely hoped that the matter will not be longer delayed, as it is prejudicial to the interests of the Borough and to the progress of intellectual development and research.

The accommodation at the Society's Rooms for Sectional Lectures having proved inadequate owing to the increase of membership, arrangements have been made to hold all lectures of general interest in Trinity Hall.

Sir Daniel Morris, K.C.M.G., kindly accepted the appointment as Delegate to the British Association held last September in Dundee, for which the Council tender their hearty thanks.

The Council is pleased to report that an arrangement has been entered into to exchange Proceedings with the Belfast Naturalists' Field Club. This Society has very generously presented 29 volumes of their Proceedings to the Bournemouth Society, constituting a valuable addition to our Library.

During the year the lease of the Society's Rooms has been renewed until March 25th, 1913. The thanks of the Society are due to Mr. Parkinson Curtis, F.E.S., in connection therewith.

The Council desires to convey the best thanks of the Society to the numerous donors of botanical, geological and other specimens, and to the donors of books. The latter are specially referred to in the Librarian's Report.

Among the more valuable gifts are the following:—Mr. R. V. Sherring, F.L.S., presented a valuable collection of fossils and about 200 sheets of dried and named plants. Mr. H. E. Swain

presented 800 specimens of dried, mounted and named foreign plants. Miss Ida Rooper, F.L.S., of Bristol, contributed a valuable collection of dried English plants, and Mr. E. H. Bellairs, J.P., presented a number of interesting palæolithic implements.

An opportunity is offered of acquiring a singularly valuable collection of Barton fossil shells, which would prove of great local and general scientific interest. If an appeal is made with this object in view the Council asks for the warm support of all members of the community, as not only is the collection of great interest to Bournemouth, but it would establish the coming Museum as of special importance to the scientific world.

The Council tender their best thanks to the various Lecturers and Conductors of Excursions for their valued services, which have so materially contributed to the success of the Society's efforts during the past year.

Hon. Librarian's Report for 1911-12.

THE Society's Library has been increased by several welcome additions during the year. There has been the usual interchange between kindred Societies and our own of Annual Reports and Proceedings.

To Mr. Arthur Gray we are indebted for a characteristic little work entitled " The Kingdom of Man " by our esteemed President, and for six more books which should be very useful to our botanical and other sections. We have to thank Mr. Parkinson Curtis for the gift of a book on the " Genitalia of the Noctuidae," with numerous illustrations, for some numbers of " The Entomologist," and for several reports and other pamphlets which, in some cases, are of special local interest. From Mr. R. V. Sherring, whose contributions to the Society have been remarkable both in number and variety, we have received an excellent plate for our last volume of Proceedings, three numbers previously missing from our set of the British Association Annual, and other books and pamphlets. Our Hon. Secretary has given us seven volumes issued by the Somersetshire Archæological Society, which are of exceptional interest and value.

Mr. de Castro has kindly presented five volumes of the " Geographical Teacher," and Dr. H. Colley March some " Proceedings of the Prehistoric Society of E. Anglia." Mr. G. Brownen gives records of the Milford-on-Sea Society; Mr. J. E. Liddiard a book on volcanic eruptions and others of interest to our Botanical Section.

Finally, Dr. Crallan, whose gifts of books, etc., have been little less than a continuous stream, has kept us up as usual in current numbers of " Knowledge." He also promised as a parting presentation, when he takes that step we all regret so deeply, many other volumes, which will go far to fill existing gaps in several of our serials. It may be added that any further gifts of books of scientific value, or subscriptions towards the purchase of some we badly want, will be heartily welcomed.

It has become an accepted fact—if from some points of view a somewhat regrettable one—that our Society cannot successfully compete with the Bournemouth Public Library in acquiring the latest and most valuable scientific works. Our funds will not permit it. So far, however, from being dismayed at this, surely we should unreservedly congratulate ourselves that it is determined to supply the public of this town with books which will also be found of the utmost value to this Society. It is even possible that our Society has unwittingly applied a certain stimulus to the acquisition of books by the Public Library of a superior class to those usually associated with similar collections.

In the meantime it is hoped to increase the attractions and usefulness of our own library in such directions as may seem open to us.

Report of the Delegate to the British Association, 1912.

SIR DANIEL MORRIS presented a brief Report as Delegate of the Bournemouth Natural Science Society at the Conference of Corresponding Societies at the meeting of the British Association for the Advancement of Science at Dundee in September, 1912.

The Chairman of the Conference was Professor F. O. Bower, F.R.S., of Glasgow; the Vice-Chairman, Harold W. T. Wager, F.R.S. (H.M. Inspector of Secondary Schools); and the Secretary, Mr. W. P. D. Stebbing.

At the opening meeting on September 5th the Chairman gave a memorable address on Sir Joseph Dalton Hooker, O.M., G.C.S.I., F.R.S., the distinguished botanist and formerly Director of the Royal Gardens at Kew. The address comprised a biographical sketch and a valuable summary of the various lines of research in which this illustrious man of science excelled. Sir Joseph was born in 1817 and died in 1911 in his 94th year. His record is hardly to be equalled in any walk of intellectual life.

The following is a list of some of the subjects discussed at the Conference:—

(a) " The Results obtained by the British Mycological Society on certain Fungoid Pests," by Miss A. Lorrain Smith, F.L.S.

(b) " A Preliminary Report of the Selborne Society's Committee for the State Protection of Wild Plants," by Mr. A. R. Horwood.

(c) " The Brent Valley Bird Sanctuary: An Experiment in Bird Protection " (with lantern illustration), by Mr. Wilfred Mark Webb, F.L.S.

(d) " Highland Lochs," by Mr. A. Newlands.

The subject of the Protection of Animals and Plants was also brought forward by Dr. Chalmers Mitchell, F.R.S., President of Section D (Zoology). At the second meeting of the Conference of Delegates of Corresponding Societies on September 10th the same subject was fully dealt with. In this leading members of Section K (Botany) took part. A summary of the discussion and the general conclusions arrived at will be published in the report of the Corresponding Societies Committee. A copy of this Report will be communicated to the Secretary and laid on the table for reference. Previous Reports of a similar character are filed in the Library.

List of Members.

* Honorary Members. † Past Presidents. A Associate Members.

Members elected since August 1st in Italics.

Members resigned since August 1st in brackets [.....].

A

Abbott, A. J.	Strathmore, 23, Westby Road, Boscombe
Ainsworth, Mrs.	Corolanty, 27, Spa Road, Boscombe
Alder, Mrs.	East Grove, Lymington
Alder, Miss Evelyn	,, ,,
Aldridge, Mrs.	Denewood, 55, Alum Chine Road
Allan, Alexr.	Bylands, Boscombe Cliff Road
Allday, J. L.	Priory Lodge, 79, Alumhurst Road
Allday, Mrs.	,, ,,
Allen, Rev. F. A., M.A.	Staffa, Wellington Road, Parkstone
Allis-Smith, Miss E.	Martello Towers, Branksome Park
Allwood, Miss C. A.	The Chimes, 5, Crabton Close Road
Anstice, Mrs. M.	Bryher, Tower Road
Anthony, H.	Crossways, 7, Burtley Road, Southbourne
Anthony, W. S.	Rosendale, 4, Branksome Wood Road
Archer, J. W.	Windlesham, 5, Braidley Road
Archer, Mrs.	,, ,,
Armstrong, Mrs.	27, Cecil Road, Boscombe
Armstrong, R.	Blythe, 17, Beresford Road, West Southbourne
Armstrong, Mrs. R.	,, ,, ,,
Aston, J. J.	Habberley, 6, Hamilton Road, Boscombe
Atkins, Dr. F.	Cathay, 44, Alumhurst Road
Atkins, Mrs.	,, ,,
Atkins, W.	The Hermitage, 40, Wimborne Road
Atkins, Mrs.	,, ,,
Atkinson, Miss	Berwyn, 36, Hamilton Road, Boscombe
Atkinson, Miss Phyllis	The Grosvenor, Chine Road

B

Backhouse, Hy.	Yelland, 5, McKinley Road
Backhouse, Mrs.	,, ,,
Bain, Mrs.	5, Christchurch Road
Bainbridge, Surgeon-General	Vernon, Sandecotes Road, Parkstone
Banfield, Col. R. J. F., C.B.	Park View, 42, Poole Road
Banks, R. Y.	Egerton, 12, Portchester Road
Barlow, E. W., F.R.A.S.	Ditton Lodge, 8, Stourwood Avenue
A*Barraclough, Aug., M.A. (Cantab)*, F.R.G.S.	56, Richmond Wood Road
Barratt, J. Hayes	Brundon, 2, Surrey Road
Bartlett, H. F. D., F.E.S.	1, Myrtle Road, Richmond Park
Batley, Dr.	8, High Street, Christchurch
Bayley, Miss D. E.	Dene House, West Hill Road
Beck, Rd.	Red Lodge, 49, Portchester Road
[A*Bell, Miss R.*]	Clonmarron, Christchurch
Bell, T. G., M.D.	38, Poole Road
Bell, Miss Winifred	St. Wulfram's, Frederica Road, Winton
Benison, F.	Aldborough House, 14, Rosemount Road
Benison, Mrs.	,, ,,
Bennett, Miss Bessie	West View, 31, Churchill Road, Boscombe

Bennett, Miss E. C.	Bonavista, 19, Boscombe Spa Road
Bennett, G.	Magdalen College, Oxford
Bennett, G.	Sigwells, 20, Belle Vue Road, Southbourne
Bennett, Mrs.	,, ,, ,,
Bennett, H. Morden	Manor Lodge, Manor Road
Bilton, Miss C. E.	Dilkhush, 25, Parkwood Road, Boscombe
Blackall, Miss	Leanfield, Castlemain Road, Stourwood
Blackett, C. H.	Rosapenna, 16, McKinley Road
Blackett, W. Eggleston	Blanchland, 21, McKinley Road
Blosse, Rev. R. C. Lynch	Hawthorn Dene, 10, Cavendish Road
Blosse, Mrs.	,, ,,
Blundell, Miss M. J.	Oakley, 17, Carysfort Road, Boscombe
*Bond, F. Bligh, F.R.I.B.A.	Glastonbury
[Boxer, Miss Violet]	Firwood, 5, Burnaby Road
Brazier, J. J.	East Hill, 32, Southcote Road
Brett, G. H.	Harbledown, 5, St. John's Avenue, Boscombe
Brett, Mrs. E. K.	,, ,,
Brett, Miss J. E.	,, ,,
Brett, Miss K. M.	,, ,,
Briant-Botley, Mrs.	Studlands, 16, Wharncliff Road, Boscombe
[Bridger, Commander N. L., R.N.]	Walton Leigh, Tower Road
[Brindley, Miss]	
Brindley, Rev. R. B.	Eastercourt, 11, St. John's Road, Boscombe
Brownen, Geo., F.C.S.	Ellington, Foxholes Road, Southbourne
Brownen, Mrs.	Talnas, Grove Road, Christchurch
Brumell, Geo., A.R.I.B.A.	,, ,, ,,
Brumell, Mrs.	Maori, Richmond Park Avenue
[Bryant, G. R.]	,, ,,
[Bryant, Mrs.]	Boyton House, Boscombe Cliff
[Buckler, Wm.]	,, ,,
[Buckler, Mrs.]	60, West Cliff Road
Bulfin, Ignatius, B.A.	,, ,,
Bulfin, Mrs.	The Den, 26, Knole Road
	,, ,,

C

Cameron, Miss	Little Forest House, 19, Bath Road
Capper, Thos., M.A., B.Sc.	Ropley, Stirling Road
Carus-Wilson, C., F.R.S. Edin., F.G.S.	Altmore, Waldegrave Park, Strawberry Hill, Middlesex
	and Royal Societies' Club, S.W.
Castle, Vice-Admiral	Micklehurst, 11, Argyll Road, Boscombe
Cavit, C. G.	Marley, 10, Argyll Road
ACHaffey, W. J.	294, Windham Road
ACHambers, D.	7, Myrtle Road, Richmond Park
Chandler, S. Whitty, B.A.	St. George's, Cecil Road, Boscombe
Chandler, Mrs. Whitty	,, ,, ,,
Chapman, F. F.	Penrhyn, 5, Argyll Road
Chapman, Miss	,, ,,
Charsley, Mrs. Julia E.	Camborne, Belle Vue Road, Southbourne
Cherry, Mrs.	Merridale, 11, Westby Road, Boscombe
Chesters, Rev. L. M.	Nantissa, 6, Suffolk Road
Chidell, Miss F. K.	Nairn, 8, Suffolk Road South
A*Chilver, Miss Kathleen M.*	79, Richmond Park Road
AChisman, Miss E. M.	Heatherlea, 11, Cowper Road, Moordown
Chittenden, H.	Kynance, 69, Talbot Road
Clark, Walter Child	Michelgrove House, Boscombe
Coddington, E. F.	St. Frideswide, 94, Southbourne Road
Coles, Dr. A. C.	York House, 3, Poole Road

[Colclough, J. E. H.]	Bellagio, 13, Pembroke Road, Westbourne
Collins, W. F.	Vellore, Overcliff Drive
Collinson, Miss K.	St. Cleather, 42, Wimborne Road
Compton, Rev. D. G.	The Downs, Clifton Road Southbourne
Cooke, F. J.	Corona, Annerley Road
Cooper, Ernest	100, Old Christchurch Road
Cooper-Dean, Mrs.	The Old Vicarage, Pokesdown
Cooper-Dean, Miss A. E.	Littledown, Christchurch
Cooper, J. Omer	Calcot, 50, Westby Road, Boscombe
Cooper, Mrs. J. Omer	,, ,, ,,
Cooper, Wilfrid Omer	,, ,, ,,
Cooepr, Rev. W. H. Windle, M.A., F.R.G.S.	Bergen, 51, Branksome Wood Road
Cowie, Dr.	Bonaccord, Westminster Road
†Crallan, Dr. G. E. J., M.A., M.B., M.R.C.S.	Gouray Lodge, Gorey, Jersey, Channel Islands
Crespi, Dr.	Cooma, Poole Road, Wimborne
Crowther, Miss Violet	Shelbrook, Brunstead Road, Westbourne
Curme, Decimus	Child Okeford, Blandford
Curme, Mrs.	Eversley, 10, Durley Road
Curtis, W. Parkinson, F.E.S.	The Square

D

Dacombe, J. M. J.	27, Holdenhurst Road
Davenport, Miss C.	Torvaine, Parkstone
Davys, Rev. S. D.	Rosebank, 39, Lansdowne Road
Day, Miss	Fairhurst, Barrack Road, Christchurch
de Castro, Geo., M.R.C.S. (Eng.)	Sunnydene, 76, Drummond Road
de Castro, Mrs.	,, ,,
de Paiva, R. A.	San Remo, 13, Carysfort Road
de Paiva, Mrs.	,, ,,
Dibben, Miss M.	c/o Mrs. Jeremy
*Dixon, Dr. J. R. L.	Torbay House, Torbay Road, Paignton
Dodd, Dr. W. H.	Maybrook, Wimborne
Dodshun, Edwin	Lloyds Bank Chambers
Druitt, J.	Avebury, 10, Madeira Road
Druitt, Herbert	15, High Street, Christchurch
Dudding, Mrs.	22, New Park Road, West Southbourne
Dunning, Mrs.	The Homestead, 21, St. Clement's Road

E

Earle, Dr.	The Wyke, Brunstead Road
Edwards, Aubrey	The Birches, Penn Hill Avenue, Parkstone
Eiloart, Miss	Glengyle, Chester Road, Branksome Park
Ellis, Hy. J.	Chesterford, Richmond Park Avenue
Elwes, Capt. G. R., J.P.	Bossington, 14, Knyveton Road
Evans, P.	Saugeen, 30, Derby Road
Evens, T., M.INST.C.E.	Pobbles, Southwood Avenue, Stourwood
Evens, Mrs.	,, ,, ,,

F

Fairles, Gustavus W.	Bank House, Alexandra Road, Parkstone
AFirbank, Miss	5, Buchanan Avenue
Foster, Miss Ada	Hendra, 2, Studland Road
Foster, Miss Amy	,, ,,
Fowler, Miss R. M.	Rushcot, 8, St. Winifred's Road
Fowler, Miss V. M.	,, ,,

Fraser-Hird, Rev. F. M.A.	Eaglehurst, 16, Parkwood Road
Frean, G. M.	Cranicombe, Branksome Avenue
Frean, Mrs.	,, ,,
Freeman, Miss Emily	Corona, Annerley Road
French, J. M.	The Gables, 12, Wharncliff Road, Boscombe
Frewin, Alfred	Rowherne, 43, Branksome Wood Road
AFunnell, Miss B. E.	Kelso, 5, Campbell Road, Boscombe
Furlong, R. O. B., C.B.	Maesbury, 3, Cavendish Road

G

Galpin, G.	Clarendon Court, Clarendon Road
Gardiner, Miss F. M.	The Rosery, 105, Alumhurst Road
Gardner, Dr. W. T.	Netherhall, 27, Poole Road
Gardner, W. Temple	Alexandra Road, Parkstone
Gardner, Mrs. Temple	,, ,,
Garland, Dr. Albert L.R.C.P. Edin., M.R.C.S. (Eng.)	The Moyne, 15, Boscombe Spa Road
Garrett, T. R. H., M.A., F.G.S., F.R.G.S.	c/o Algemeene Exploratie Maatschappij, Palembang, Sumatra
Gaussen, Miss Elsie	Ardnagreina, 3, Stourwood Road
[Ghey, Mrs.]	Berwyn, Richmond Park Avenue
Gibbons, Miss Ada	Ambleside, Frankstone Road, West Southbourne
[Giles, F. W., M.B. (Durh.), M.R.C.S. (Eng.)]	19, Lansdowne Road
Gissing, Admiral C. E.	Homestead, Queen's Park South Drive
Going, Miss F.	St. Paul's House, Parkstone
Goodall, T. B., F.R.C.V.S., F.L.S.	Purewell Cross, Christchurch
Gorringe, Rev. P. R	124, Richmond Park Road
Gorringe, Mrs.	,, ,,
Graham, F. A.	21, Beaulieu Road
Grange, Dr. W. D'Oyly	11, McKinley Road
Gray, A.	Woodville, 26, Melville Road, Winton
Gray, Geo. W.	Darena, 15, Wellington Road
Gray, Mrs.	,, ,,
Gray, Joseph Wm., F.G.S.	6, Richmond Park Crescent
Griffiths, Capt. David, S. & T. Corps, I.A., retired	Bursledene, New Milton
Grindley, Miss E. J.	Chatfield, Parkstone
AGuest, G., B.A.	St. Paul's School
AGuy, Miss	,,

H

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Hamilton, Mrs.	,,
Hamilton, Major Claude	Westholme, Foxholes Road, Southbourne
Hammer, Miss A. G.	66, Lowther Road
Handley, Rev. S. B.	Copthorne, Heathwood Road, Winton
AHarding, Miss	Alma Road Council School
Hardwick, Philip	21, Commercial Road
Harrison, Miss E. Margaret, LL.A., L.C.P.	West Heath School, Belle Vue Road, Southbourne
Harrison, Henry	Southlea, Durley Road, West Cliff
Harrison, Miss Nora B., F.R.H.S.	Sandigate, Stourcliff Avenue, West Southbourne

Hawker, Miss	Kingsbere, Meyrick Park Crescent
Hayllar, J., J.P.	Redholme, 14, Cambridge Road
Hayllar, Miss	,, ,,
Haylock, Dr. S. J.	Balsham, Clifton Road, Southbourne
Heaton, Guy, M.A.	St. David's, 51, West Cliff Road
Henslow, Rev. Professor G., M.A., F.C.S., F.G.S.	Danehurst, 40, Branksome Wood Road
Heywood, Col. J. M.	Sutherland Hall, South Cliff
Hill, S. McCalmont, D.C.L.	The Priory, 20, Argyll Road, Boscombe
Hinton, Miss	Welcombe, 1, Argyll Road, Boscombe
[Hollins, J. C.]	Mitford, 12, Pembroke Road
Holmes, C. F.	Brackenwood, 37, Southern Road, West Southbourne
Holmes, Mrs.	,, ,, ,,
Holmes, Miss M. A.	4, Beaufort Road, West Southbourne
Holmes, Miss S. C. M.	,, ,,
Homer, L. F. C.	1, The Maisonettes, Vale Road
Honeyman, G.	Stormont, Milton Road
Honeyman, Mrs.	,, ,,
Honeyman, Miss M. W.	,, ,,
Horton, Rev. Canon R.	St. Mary's Lodge, Guildhill Road, Southbourne
Hudson, F.	Peñarol, Parkstone
Hudson, Mrs.	,, ,,
Hughes, D.	Meran, 49, Wellington Road
Hunter, H. J.	Castle Bar, 32, Crabton Close Road
Hunter, Mrs.	,, ,,
Hurry, Miss G. M.	Ingarth, 3, Twynham Road, Southbourne

I

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J

[Jackson-Smith, Rev. T.]	Hollingbury, Calthorpe Road, Richmond Park
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James, Mrs.	,, ,,
James, Miss G. Gladys	,, ,,
Jeffery, T. J. P.	Meldon, Ormonde Road
Jeffery, Miss Ruby	,, ,,
Jeffery, Miss E. S. M.	The Haven, 38, Sea Road
Jennings, Miss C. E.	Edenhurst, Sandbanks Road, Parkstone
Jeremy, Mrs.	Whalley Grange, 10, Portarlington Road
Jeremy, Dr. Mary	4, Richmond Hill
Jermyn, F. L.	The Continental
Joachim, Mrs. Hy.	Solheim, Milner Road
Joachim, Miss Dorothy	,, ,,
AJones, W.	Council School, Boscombe
Jones, W.	254, Old Christchurch Road

K

Kay, A. J.	Winsgarth, 141, Lowther Road
Kaye, J. E.	Tynedale, 38, Portchester Road
Kaye, W. J.	Birk House, 3, Wollstonecraft Road
[AKeen, Miss A. E.]	Collegiate School, Poole Road
Keevil, W. C.	Eglington, Kinson, Bournemouth
Keighley, Miss	Stourcliffe, Stourcliffe Avenue, West Southbourne

Kent, Geo. G.	Ballinhassig, Southwood Avenue, West Southbourne
Keogh, Duncan	The Warren, 13, Richmond Wood Road
Keogh, Mrs.	,, ,,
Kerby, Miss	Shelford Lodge, Southwood Avenue, West Southbourne
Kirkby, Mrs. J.	Inglewood, Richmond Park Avenue

L

Langley-Smith, W.	Alumhurst Tower, 115, Alumhurst Road
Langley-Smith, Miss	,, ,,
Langley-Smith, Miss R.	,, ,,
Lattey, F.	Alyngby, Stourcliffe Avenue, Stourwood
Le Juene, Hy.	St. Ives, Ashley Road, Upper Parkstone
Lendrum, Miss A. M.	c/o Mr. de Paiva
Lendrum, Miss E. A. E.	,,
Letcher, Mark Jameson	Gwestfa, 18, Richmond Wood Road
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Lilley, Mrs.	,, ,, ,,
*Linton, Rev. E. F., M.A.	Edmondsham, Salisbury
Lucas, Arthur	Croftmoor, 23, Dean Park Road
Lucas, Arthur, Junr.	Highfield, Richmond Park Avenue
Lupton, Miss	Bolingbroke, Knole Road
Lyon, Claude	Shalimar, Wilderton Road, Branksome Park
Lyon, Mrs.	,, ,, ,,

M

MacAlister, R., M.I.C.E.	Somerled, 29, Meyrick Park Crescent
MacAlister, Mrs.	,, ,,
AMcBean, Miss S.	Freebelheim School 47, Lowther Road
McBean, Miss J.	Inglenook, 29, Parkwood Road
AMackay, Miss	St. Andrew's School, Malmesbury Park
Mackelvie, J. Mc Intosh	Cliff Cottage, Boscombe Manor Park
Mackelvie, Mrs.	,, ,,
Mackelvie, Miss Esther H.	,, ,,
Mackelvie, Miss Doris	,, ,,
[Mackley, E. H. Alborough L.D.S., R.C.S. (Eng.)]	Vermont, Dean Park Road
Mahs, Miss E. M.	Castle Court, 23, Boscombe Spa Road
Mann, W. P., B.A.	38, Crabton Close Road
March, H. Colley, M.D., F.S.A. M.R.S.A.I., F.A.I.	Nethergrove, Portesham, Dorchester
Marks, Miss H.	Bourne Hall Hotel
*Markwick, Col. E. E. C.B. F.R.A.S.	c/o Sir C. R. McGrigor, Bart., & Co., 25, Charles Street, St. James' Square, S.W.
Martland, Dr. T.	Standish House, Fitzharris Avenue
Martland, Mrs.	,, ,,
Mate, Ald. C. H., J.P.	Elim, 3, Surrey Road South
Maude, W. C., J.P.	Brackenwood, Gervis Road
Maybery, Joseph, J.P.	Langley Dene, 55, Wellington Road
Maybery, Mrs.	,, ,,
[Mercer, Dr. W. B.]	Ryburn, Belle Vue Road, Southbourne
Michell, Theo., M.I.C.E.	Trewirgie, 37, Christchurch Road
Michell, Mrs.	,, ,,

Miller, Joseph, L.D.S., R.C.S (Edin.)	Wenonah, 37, Poole Road
Miller, Mrs.	,, ,,
Montgomery, Miss L. F. M.	Everton, 49, Westby Road
Moon, Miss	c/o Mr. Maybery
Moon, P. G. G., F.C.S.	Hill Croft, Alexandra Road, Parkstone
Moorhead, Dr.	Imperial Hotel
*Morris, Sir Daniel, K.C.M.G. M.A., F.L.S.	14, Crabton Close Road
Morris, Lady	,,
Morton, Miss C. I.	Castle Court, 23, Boscombe Spa Road
Moss, Miss	The Grange, 52, Westby Road
Mossop, A. G., D.P.H., M.R.C.S., etc.	19, Wimborne Road

N

Neale, J., B.A.	36, Beaufort Road, West Southbourne
Neale, Mrs.	,, ,,
Neale, Miss D.	,, ,,
Neale, Miss C. M.	14, Carysfort Road, Boscombe
Neave, Mrs.	Lingdale, 73, Lansdowne Road
Neave, Miss	,, ,,
Nelson, Mrs. Beatrice	Northwood Lodge, 61, Wimborne Road
Neve, Miss	Merridale, 11, Westby Road
Nicholson, Mrs.	Ashfield, 7, St. Clement's Road
Noble, Miss E. I.	Castle Court, 23, Boscombe Spa Road
Norman-Hill, Mrs.	Yelvertoft, 50, West Cliff Road
Nunn, Dr.	Gestingthorpe, 3, Hayes Avenue

O

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Oke, A. W., B.A., LL.M., F.G.S., F.S.A.	32, Denmark Villas, Hove, Brighton
Old, Robt. H.	5, Westover Colonnade
Oliver, C. R.	Ambleside, 33, Parkwood Road
Oliver, Mrs.	,, ,,
Ord, Dr. W. T., F.G.S.	Greensted, 14, Madeira Road
[Ord, Mrs.]	,, ,,
[Ord, Miss]	,, ,,

P

Page, T.	Trevissome, Parkstone Road, Poole
Page, Mrs.	,, ,, ,,
Page, Miss P.	,, ,, ,,
Pain, Miss M. T.	Membury, 52, Wellington Road
Painter, Hubert, B.SC., F.C.S.	29, Talbot Road, Winton
Painter, Mrs.	,, ,,
Parish, Miss	Bentley Lodge, 9, Hengist Road
Parmiter, C. J.	Milton House, 29, St. Leonard's Road
Parmiter, Mrs.	,, ,,
Parmiter, P. J.	,, ,,
Pate, Rev. J.	Spencer House, Constitution Hill, Parkstone
Pechell, Sir A. Brooke, Bart.	c/o Messrs. Holt and Co., 3, Whitehall Place, S.W.
Pechell, Miss	,, ,,

Pestell, Miss	Engelberg, Surrey Road
APettifer, Miss C. B. B.SC. (Lond.)	Towerfield, 28, Poole Road
Phillips, Mrs.	42, Alumhurst Road
Philpott, C. C.	Hinxhill, 68, Westcliff Road
Philpott, Mrs.	,, ,,
APovah, Edwin	Woodseat, Southern Road, Stourwood
Preston, Donald W.	Bank Chambers, Yelverton Road
Price, Miss	Shelford Lodge, Southwood Avenue, West Southbourne
APritchard, Miss M. E.	Eildon, Langdon Road, Parkstone
Pugh, Miss	The Albynes, 9, St. Winifred's Road
Pullman, A.	Seacroft, Cliff Drive, Southbourne
Pullman, J.	The Knollsea, Lilliput, Parkstone
Pyemont, Miss Rosa U.	32, Hawkwood Road, Boscombe

Q

[Quertier, Miss Amy]	Lea, Wimborne
[Quilliam, Miss E.]	76, Westcliff Road

R

Rankin, W. Munn, (Leeds), B.SC. (Lond.) M.SC.	Stoneleigh, Heron Court Road
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Ransome, Miss	,, ,,
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Reed, F.R.C., M.A., F.G.S.	Gaultier, Madingley Road, Cambridge
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[Rogers, Miss F. E.]	,, ,,
*Rogers, Rev. Moyle	Chetnole, 11, Grosvenor Road
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Rooper, Miss C. Agnes	Pen Selwood, 13, Gervis Road East
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Ross, Col. W. H.	Ambleside, 9, Dean Park Road
Rowe, Mrs. R. Vidal	Viwa, 9, McKinley Road
Rudkin, Miss F.	Ivel Cottage, 25, Hamilton Road, Boscombe
Rumsby, Mrs. S.	Ennisfall, Fitzharris Avenue, Charminster Park
Rutherfurd, C. R.	South Dene, 1, Groveley Road
Rutherfurd, Mrs.	,, ,,
Rutter, G. H., M.B.	Roxbury House, 22, Poole Road
Rutter, Mrs.	,, ,,
Ryde, Kenneth A.	45, St. Swithun's Road

S

St. Barbe, H.	Okehampton, 3, Milton Road
St. Leger, Col.	Christchurch Lodge, 12, Rosemount Road
Salmon, T. E.	Mon Abri, 14, Herbert Road
ASaunders, Hugh A. B.A., F.R.G.S.	Brookfield House, Swanage
Saunders, Miss L. Matta	Pine Cottage, Chester Road, Branksome Park
Scarlett, Miss A.	Fermoy, St. Alban's Avenue
Scarlett, Miss K.	,, ,,
Scarlett, Miss M.	,, ,,
AScattergood, J.	Alma Road Council School

Scott, J. H., M.E., M.I.M.C.E.	Skiddaw, Talbot Hill, Winton
Scott, W. H., M.A.	Hendall, Westminster Road
Searle, A. H.	The White House, Grove Lane, Christchurch
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Sells, H. Martin	Pearlhaven, Canford Cliffs
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Sherring, Miss O. L.	,, ,,
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Shillitoe, Miss Mary Monica	Ardvernis, 3, Richmond Gardens, Richmond Hill
Shore, Miss Janet D.	Wharncliffe, Queen's Road, Bournemouth Road, Parkstone
Smith, Francis F.	5, Castlemain Road
Smith, Rev. H. Philip	Spinney Hill, 44a, Grosvenor Gardens, Boscombe
Smyth, Miss E. Watson	Ingarth, 3, Twynham Road, Southbourne
Smythe, J. H. Ralph., J.P.	Willstead, 22, Cavendish Road
Solly, Rev. Hy. Shaen	Southcote, Alexandra Road, Parkstone
Southby, Miss E. H.	Twyford Lodge, 17, Cavendish Road
Sowter, Miss	c/o Mrs. Hy. Joachim
Spencer, J. F.	Glenthorne, 73, Richmond Park Road
Spriggs, A. T.	The Bryn, 95, Belle Vue Road, Southbourne
Spriggs, Mrs.	,, ,, ,,
Stevenson, E. A.	Northwood, 16, Windermere Road
[Stevenson, Col. W. F., C.B.]	Drimna, 27, Portchester Road
[Stock, W. H.]	Livadia, 79, Paisley Road, West Southbourne
Stokes, R.	Laverstock, Cliff Road, Boscombe
Stokes, Norman	,, ,, ,,
[Stothert, W.]	The Hatch, 15, Warren Road, Alum Chine
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Stuart, Mrs.	,, ,,
Stuart, Miss	,, ,,
Sulivan, Gerald H., B.SC.	The Old Ride, Branksome Park
Sutton, H.	Ravenshall, 2, Chine Crescent Road
Sutton, Mrs.	,, ,,
Sutton, K. H. M.	.. ..
Sutton, Miss C. E. M.	,, ,,
Swain, H. E.	Sorrento, Studland Road
Swain, Mrs.	,, ,,
Swallow, E.	Westridge, Sandbanks, Parkstone
Sworn, Mrs.	Normandale, 63, Lansdowne Road

T

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[Tame, T.]	Hengistbourne, 24, Gordon Road
[Tame, Miss May L.]	,, ,,
[Tame, R. G.]	,, ,,
[Tame, T. G. G.]	,, ,,
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Tatchell, Leonard	23, Arcade
Thomas, J.	c/o Bright's Stores
Thompson, Rev. G., M.A.	Highbury, 4, Bodorgan Road
Thompson, C. R.	Holmwood, Castle Hill, Parkstone
Thompson, Miss Alice	,, ,, ,,
Thompson, Miss A. C.	,, ,, ,,
Thompson, Miss Ellen	,, ,, ,,

Thomson, Dr. J. Roberts, J.P.	Monkchester, 17, Manor Road
Thomson, Mrs.	,, ,,
Thomson, Matthew	Fircliff, 29, Studland Road
Tickell, Miss S. M.	Boscombe Lodge, 12, Boscombe Spa Road
Toppin, Mrs.	Westminster Cottage, Branksome Park
[Towle, Rev. W. Harrison]	Collett House, 13, Drummond Road
Towsey, Miss E. L.	Moseley, 20, Owls Road, Boscombe
Treeby, Miss C. S.	Wyvenhoe, 7, Stourwood Road
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Tunnard-Moore, J. C., J.P.	Dunedin, 2, Darracott Road, Boscombe Park
Turner, J. E.	Bramley, Surrey Road

U

Usherwood, Rev. Canon	Bagdale, Parkstone

V

[Vallentin, J., F.R.G.S.]	20, Prince of Wales Road
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Veale, Miss L. H.	,, ,,
Vernon, Dr. A. H.	1, Carnarvon Crescent, Boscombe
Vipan, Miss Dora	St. Michael's Vicarage

W

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*Wallace, Dr. Alfred Russel O.M.	Broadstone, Dorset
Waldron, Miss	Benvenuto, 15, Portarlington Road
Waldron, Miss F.	,, ,,
Walter, Mrs. G. P.	Rusholme, 23, McKinley Road
[Warburton, Dr.]	Satara, Chester Road, Winton
[Warburton, Mrs.]	,, ,, ,,
Warr, Miss Ada	Cottesmore, Pokesdown Hill
Waters, A. W., F.L.S., F.G.S.	Alderley, 2, McKinley Road
Waters, Mrs.	,, ,,
Watson, J. J.	Golftyn, Parkstone Avenue, Parkstone
Watts, Col. Sir Wm., K.C.B.	The Priory, 53, Branksome Wood Road
Webster, Rev. T.	Devonia, 2, Chatsworth Road
Webster, Mrs.	,, ,,
Welby, Rev. A.	Englefield, 3, Groveley Road
Wells, H. B., F.R.M.S.	Stalham, 16, Studland Road
Wells, Mrs.	,, ,,
Westwood, Miss	Ambleside, 12, Frankstone Road, West Southbourne
Whiting, Albert	Rozel, Pinecliffe Avenue, West Southbourne
[Whiting, Mrs. A.]	,, ,, ,,
[Whiting, Miss E.]	,, ,, ,,
[Whiting, Miss K.]	,, ,, ,,
Wilkinson, Mrs.	Mon Repos, 36, Grosvenor Gardens, Boscombe
Williams, Rev. Richard	Kingsworthy, 22, Church Road, Southbourne
Willes, W. A.	Elmwood, Cranborne Road
Willis, Col. Legge	Norwood, 21, Grand Avenue, West Southbourne
Wolfe, A.	Richmond Hill Printing Works

Wood, Samuel, F.C.A., M.I.C.E.	Beverley, 27, Grand Avenue, West Southbourne
Wood, Miss	,, ,, ,,
AWoodhouse, W. J., A.C.P.	35, Chatsworth Road
Woollacott, J. C.	Solent View, 79, Belle Vue Road, Southbourne
[Worsley-Benison, Miss H.]	121, Lowther Road
Wray, Capt. C. A.	Ards, Talbot Avenue
Wray, Miss	,, ,,
Wray, Miss D.	,, ,,
Wray, Miss W.	,, ,,
Wright, Rev. T. Russell	Mountside, 38, Westbourne Park Road
[Wright, Mrs. A. L.]	Spelsbury, Warren Edge Road, Southbourne
Wyatt, Miss H.	20, New Park Road, West Southbourne
Wyatt-Roberts, C.	Woodmansterne, Foxholes Road, Southbourne
Wyatt-Roberts, Mrs.	,, ,, ,,

Y

Yates, R. P.	Woodmanton, 35, Wellington Road
Yates, Mrs.	,, ,,
Yates, Miss J.	,, ,,
Yates, T. A.	,, ,,

RULES OF THE

Bournemouth Natural Science Society.

Amended to February 5th, 1912.

Title

1.—The title of the Society shall be THE BOURNEMOUTH NATURAL SCIENCE SOCIETY.

Objects

2.—The objects of the Society shall be the promotion of the study of Science in all its branches, by means of Lectures, Field Meetings, the Reading and Discussion of Papers, and the formation of Sections of its members devoted to any particular branch of the Society's work, or by any other means that the governing body of the Society shall deem advisable.

3.—The Society shall encourage the making of reports on any plant, animal, or object of interest, and where the Society may deem it necessary, shall take such steps as may be advisable to secure any such plant, animal, or object of interest from injury, extinction or destruction.

Members

4.—The Society shall consist of Ordinary, Life, Associate, and Honorary Members.

Council

5.—There shall be a Council of the Society consisting of the Hon. Treasurer, Hon. Secretary, Hon. Assistant Secretary, Assistant Secretary, the Vice-Presidents who have filled the office of President, the Hon. Librarian, the Chairmen of Sections and eight elected Members.

The Council shall have the general management of the Society. At all Meetings of the Council, five shall form a Quorum. The Council shall elect their own Chairman and Deputy-Chairman for the Year, and shall have power to fill up any vacancies in their number which may occur from time to time. The Council shall have power to appoint Committees to deal with any business that may be delegated to them.

The Chairman, or in his absence the Deputy Chairman, at all Meetings of the Council shall have an original and a casting vote.

The Council shall have the control of the Funds of the Society.

Executive Officers

6.—The Executive Officers of the Society shall consist of the Chairman and Deputy Chairman of Council, Hon. Treasurer, Hon. Secretary and one or more Assistant Secretaries.

7.—The Ordinary, Life, and Associate Members of the Society shall be proposed by an existing Member, and seconded by another existing Member, and notice shall be sent to one of the Secretaries of the Society of the names and address of the nominee, and the names of the proposer and seconder. Any such proposed new Member shall be voted for at the next ensuing Council Meeting, and if two-thirds of the Council present and voting shall vote for the proposed new member, such candidate shall become a Member upon payment of the Annual Subscription, and shall receive a card of Membership (not transferable) entitling him or her to attend the Meetings of the Society. Members joining during August and September shall be given a card of membership to September 30th of the following year.

Ordinary Members

8.—Ordinary Members shall pay an Annual Subscription of Ten Shillings, due on the first day of October in each Year. The Annual Subscription for Adult Members of the same family, not exceeding four and residing in the same house, shall be Twenty Shillings, each Member being elected in the usual manner and each receiving a card of membership.

9.—The Subscription for Life Members shall be Five Guineas. Any Ordinary Member who shall have commuted his Subscription, as provided for in this Rule, shall become a Life Member, but shall not by reason thereof have any different rights from those of an Ordinary Member. **Life Members**

10.—Associate Members are those who by payment of an Annual Subscription of Two Shillings and Sixpence are entitled to attend all the General Meetings and Excursions of the Society. They also have the privilege of attending the Meetings and Excursions of one particular Section they may select at the time of their election or at the commencement of each session, their choice being notified by them to the Hon. Treasurer. The following are entitled to become Associate Members on Election by the Council. **Associate Members**

(a) Teachers in schools who are still engaged in the active duties of their profession.

(b) Persons who in the opinion of the Council although unable to pay the fee for full membership, are by their acknowledged scientific tastes or attainments, likely to prove useful working Members of the Society.

On further payment of Two Shillings and Sixpence Associate Members are admitted to the Meetings and Excursions of all the Sections.

Associate Members shall have no power of voting on the affairs of the Society, or of holding office.

11.—Any person who is either distinguished in Science or has rendered any special service to the Society, may be elected an Hon. Member. Such Hon. Members shall be proposed and elected in the same way as Ordinary Members. **Honorary Members**

12.—Any Visitors introduced by a Member or producing a Member's card, may be admitted to any Meeting or Excursion of the Society on entering their names and that of the introducing Member in the Society's Visitors' Book. Such privilege not to be granted more than twice to any one person in each Session. **Visitors**

On the recommendation of the Council or Committee authorised by it, Visitors to Bournemouth desirous of attending the Meetings or Excursions of the Society, may obtain a ticket of admission for the Winter or the Summer Meetings or Excursions at a charge of Seven Shillings and Sixpence. Application to be made to the Hon. Secretary for submission to the Council or Committee authorised by it.

13.—Any Members whose subscriptions are unpaid at the end of the financial year (September 30th), on notice to that effect in writing having been given to them by the Hon. Treasurer, shall be reported to the Council, who shall have the power of removing their names from the list of Members.

14.—Resignations should be in writing, and addressed to one of the Hon. Secretaries, and until such are received by them, Members remain liable for their subscriptions.

15.—The power of expulsion of a Member from the Society for objectionable conduct shall be vested in a General Meeting of the Society, provided the Council has caused special notice to be given on the circular convening the Meeting, and that two-thirds of those present and voting agree thereto.

16.—The Council shall arrange all Lectures, Papers, Demonstrations and Exhibitions of Specimens, etc., both for the General and Sectional Meetings of the Society, and shall decide upon all General and Sectional Excursions.

Sections

17.—The Council shall have power to form any Section or Sub-Section, to consist of not less than six Members, for the study of any special subject which the Council may deem within the scope of the Society's work. They shall annually appoint the Chairman of any such Section or Sub-Section on the nomination of that Section or Sub-Section.

A Section shall consist of those Members who attend in each year not less than three meetings of such Section.

The Chairman of each Section shall appoint a Secretary, who in addition to the ordinary secretarial duties shall keep a list of the Members of the Section.

Sectional Meetings

18.—Each Sectional Chairman shall be responsible for the preparation and arrangement of each Sectional Meeting and Excursion, and shall submit details of the same to the Hon. Secretary for submission to the next ensuing Meeting of the Council. He shall submit accounts of costs incurred by him to the Hon. Treasurer, after each Meeting or Excursion, who shall lay the same before the Council at their next ensuing Meeting. At the first Meeting of each Section or Sub-Section in the Year, after the annual Meeting, such Section or Sub-Section shall nominate its Chairman.

19.—A book for each Section shall be provided by the Secretaries to be kept at the Society's Room; each Chairman of Section, or his Secretary shall enter therein an account of each Meeting, with number of Members attending, and notes of any matters of interest observed or discussed. Such book to be presented at each Meeting of the Council. Every Chairman of Section shall report at each Meeting of the Council. Every Chairman of Section shall report as to the work of his section at the Annual Meeting of the Society.

20.—Any Members of the Council other than Ex-officio Members who shall have failed to attend half the Meetings of the Council held in any one year, provided that such non-attendance be not caused by illness or absence abroad, shall not be eligible for re-election, except by desire of the Members present at the Annual Meeting.

The President

21.—The President need not necessarily be selected from Members of the Society, and shall be elected annually. He shall deliver an Address at as early a date in the Winter Session as can be arranged.

Vice-Presidents

22.—Any Member of the Society who, in the opinion of the Council, shall have rendered distinguished service to Science or to the Society, shall be eligible for election as a Vice-President at the Annual Meeting, as long as he or she remains a Member of the Society.

23.—Each of the Vice-Presidents in rotation shall be requested to act as Chairman at the General Meetings of the Society.

Secretaries

24.—The Secretaries shall perform all the usual secretarial work; shall keep minutes of all Council Meetings, and the Annual Meeting, and a synopsis of all General Meetings. They shall cause a programme of each General Meeting to be sent to every Member seven days at least before each such Meeting. They shall make all preparations for carrying out all General Meetings and General Excursions, at which they shall receive from each Member his or her share of the day's expenses, and therefrom defray all costs of the Meeting. Any surplus of such collection shall go to the General Fund, and any deficit be defrayed out of that fund. They shall keep an account of all out-of-pocket expenses incurred in arranging Meetings and otherwise. They shall give notice of their election to all new members, they shall furnish a copy of the Annual Report to all Members who have paid their subscription, to Honorary Members, and to any such Scientific Societies as the Council may from time to time appoint to receive them.

Treasurer

25.—The Honorary Treasurer shall have the custody of the General Funds of the Society. He shall prepare a Financial Statement at the end of each Financial Year to be presented to the Council at the Meeting next preceding the Annual Meeting. He shall receive and acknowledge all Subscriptions, and shall issue tickets of Membership to all persons who are duly elected and have paid their Subscriptions. He shall bring before the Council any accounts that are due for payment. After presentation of the Balance Sheet to the Council, he shall submit it to the Auditors and lastly to the Annual Meeting of the Society.

26.—At the Annual Meeting and at all General Meetings of the Society, not less than ten Members shall form a quorum.

Annual Meeting

27.—At the Annual Meeting, which shall be held in the month of October, the President, the Executive Officers (except the Chairman and Deputy Chairman of the Council), the Hon. Librarian, eight Members of Council and two Auditors for the ensuing year shall be elected (either Auditor having the power to audit the accounts in the unavoidable absence of the other.) At this Meeting the Council's Report of the past year, together with those of the Chairmen of Sections, and the Hon. Treasurer's statement of accounts, duly signed by the Auditors, shall be submitted.

28.—Alteration in the Rules shall be sanctioned by a majority of not less than two-thirds of the Members present and voting at the Annual Meeting, or at a Special Meeting called for that purpose, and no alterations shall otherwise be made.

29.—Notice convening an Annual or Special Meeting, together with any proposed alterations in the Rules, shall be given to Members at least seven clear days before such Meeting be held. Notice of General Meetings, and Council Meetings (if possible) shall be given at least seven clear days beforehand.

30.—On a written requisition, signed by at least five Members of the Society, the Council shall call a Special Meeting to consider any question as to the affairs of the Society, such Meeting to be called within three weeks of the receipt of the requisition, and at least seven days' notice shall be given to the Members. At such Meeting no other business than that mentioned on the requisition, and on the notice convening such Meeting, shall be considered.

Report of the Inaugural Meeting of the Session 1911-12,

AND THE

Presidential Address

Delivered November 11th, 1911, by

Sir Ray Lankester, K.C.B., F.R.S.

Sir E. Ray Lankester, K.C.B., D.Sc. (Oxon.), LL.D., F.R.S., F.L.S., etc., the new President of the Bournemouth Natural Science Society, gave his Presidential address at an open meeting of the Society held in the Prince's Hall, Grand Hotel, on Saturday afternoon. Notwithstanding the very wet weather, there was an attendance of nearly 250 people. From 4 to 5 p.m. the Council were "At Home" in the room adjoining the Prince's Hall, where tea was served, and during this hour specimens illustrative of Sir Ray Lankester's address, which was entitled "The Most Ancient Evidences of Man's Existence in Europe," were exhibited. The contributors of valuable collections of flint implements, etc., included Mr. H. Druitt (Christchurch), Mr. E. H. Bellairs, Mr. R. V. Sherring, Mr. Waddington, Mr. J. H. Scott, Mr. A. R. Mangin, Mr. G. H. Burt, Dr. Ord, Mr. Backhouse, Mr. H. le Jeune, and others. Mr. Scott's collection was especially interesting. In addition to a case of flint implements and weapons he showed large coloured pictures (his own work), pourtraying both palæolithic and neolithic man. The Retiring President (Dr. Dukinfield H. Scott, M.A., LL.D., F.R.S., F.G.S., President of the Linnean Society), presided.

Sir Ray Lankester, before giving his lecture, said he accepted the Presidency of the Bournemouth Natural Science Society with great pleasure, and chiefly because he had derived very great enjoyment from staying occasionally at Bournemouth. He hoped and believed that a great deal would be done by this Society in the study of the natural history of the neighbourhood in all its different departments, particularly in the very interesting subject of the history of ancient man. It was with great pleasure he succeeded in the Presidency of his old friend Dr. Dukinfield Scott, who was the President of the Linnean Society in London.

Proceeding to speak of the most ancient evidences of the existence of man in this part of the world, Professor Lankester first explained the term "prehistoric man," and said that prehistoric man lived when writing had not come into existence. The earliest written records of man do not extend beyond 2,000 years in this part of the world, and a little further in the East. Only a few hundred years earlier we get to a period when all that we know about man is due to the remains of ancient buried cities, temples,

and all kinds of sites which have been excavated, showing works of art, implements, and the mode of living of ancient man before the time of writing. It is somewhat difficult to draw an absolute line between the latest of those men and the men who learnt to write records. But we very soon get back to a period when in this part of the world—Europe—men had not the use of iron. We pass out of the iron age. Even at the time that the Romans had the use of iron the people of France and England did not use it, but used bronze. This bronze age extends to a somewhat earlier period. The predecessors of the Romans in Italy had only bronze and no iron, and so it was also in Greece, when a fairly high civilization obtained. Thus the iron age was comparatively a late one and is that in which we are still living. Behind the iron age we come to the bronze age, and this age succeeded the stone age in Western Europe about 2,000 or 3,000 years ago. The great stones of Stonehenge apparently belong to a period when bronze was just coming in and stone going out. Before bronze, man had nothing but stone with which to make cutting implements. Further east, the metal period extended a little farther back; but at about 5,000 years B.C. all the world they knew of in the eastern parts of Europe as well as the western was simply dependent upon stone of one kind or another. In that stone period great advantage was apparently enjoyed in Western Europe on account of the existence there of great stores of magnificent flint. Probably in those times great flints were of more value than coal mines are in the present day. These people used flints by preference for making all kinds of knives, hatchets, hammers, and other weapons or implements. In some parts of Europe where flint was not accessible other very hard stone (such as quartzite) was used. But flint was the best of all materials and—as was seen in the latter part of the stone period, just before the use of metals was discovered—enormous facility was gained in the manipulating, chipping, and sculpturing of flint. This facility to a certain extent remains to the present day. In a few localities flint is still worked for the purpose of making gun flints, and it is an interesting fact that people so working at Brandon, in Suffolk are the direct successors of prehistoric man, for there have always been flint works at Brandon. In the later stone age, and even in the earlier stone age, there was digging in the chalk for flint, and the production of beautifully sculptured flint. There was probably considerable trade in manufactured flint by means of exchange between countries which had a good supply of flint. In Egypt, and even in India, we find stone implements made of other material—chert, quartzite, or other substances. The stone period can be traced back 4,000 years, and is divided into two groups of successive periods, in the later one of which flint was chipped and then polished. We have found the stones upon which the flint was polished, these being coarse sandstone, such as the sarsen-stone in this part of the world, a very hard, gritty siliceous stone.

Blocks of this stone are found grooved through their being used for rubbing the already chipped flint into a polished condition. The frequent form of the neo-lithic (or later stone period) implement was what was called the "celt." (Professor Lankester showed an example lent him by Mr. J. H. Scott, of Winton). Celt is the Latin word for chisel. These oblong celts are commonly described by country people as thunder-bolts. It is a very curious fact that these flint implements are supposed to have fallen from the skies. The same kind of idea obtains in the West Indies with regard to some weapons found there. (Professor Lankester gave blackboard illustrations of this and other neolithic worked flints, and showed that some were more elaborately fashioned than others, especially those found in Denmark. He described the fracturing and flaking of flints by the blows of prehistoric man, and said that natural forces could not produce such results, as people at one time asserted.) That the neolithic period extended at least as far back as about 7,000 years before Christ is known by certain things found in some of the Swiss lake dwellings and other deposits in which polished flints have been found. The people of the neolithic period no doubt advanced in civilization and arts of various kinds during those seven thousand years, and they became very skilful in their treatment of flint. Even the earliest of them seem to have had in Central Europe a life very much like that of the peasant of the present time in that part, excepting that instead of metal they had the use of stone. They cut wood very well, they built wooden houses, and they had different kinds of fabrics, including woven linen. They cultivated flax and grew wheat, barley, etc.; and they had the same fruit trees, and also the same domestic animals as we have now.

The Lecturer explained the geological mode of arriving at the age of prehistoric man, and incidentally said that the evidences furnished by the plateau gravels on the sides of the Thames at the present day indicated that quite possibly a million years, and cerainly not less than 500,000 years, had passed since the earliest of these gravels was deposited. It was during the glacial period that some of these river gravels were deposited; the south of England near the coast line was free from ice, and that men were living there is certain because their implements are found in the gravels. They were in France and parts of Germany also. The flint implements at that period were quite different from those already spoken of, they were never polished and were of pointed oval shape. The history of the study of flint implements since their great age was first recognised—in 1859—was dwelt upon, and various types of flints—including the Acheuillian, the Moustierian, and the Chellian—found in gravel deposits of varying ages were examined in detail, reference being made to the now extinct animals whose bones were sometimes found with these relics of early man in gravels and in caves. By means of lantern slides, as well as by actual flints, the audience were shown the differences of workmanship according to the

degree of man's civilisation, and a specially beautiful picture was shown, being a photograph of an Acheuillian flint by Dr. Hamilton by the Lumière colour process. But the most interesting illustrations were those of "the latest discovery," namely, flint implements found two years ago in the eastern counties of England by Mr. J. R. Moir, of Ipswich, below the Red Crag, absolutely at the very base, below the shelly crag and resting on the London clay.)

These flint implements are quite unlike river gravel types. They are of eagle's beak shape—hence called "rostro-carinate" implements—and the men who made them must have had huge flints to work on. Scratches on these implements afford evidence that the tools were made before the ice covered the surface of Suffolk and Norfolk, and that therefore there was ice before the Red Crag Bed was deposited—a fact that was most important to geologists. These implements are of the very greatest interest, because they carry back the existence of man to a far more distant period than that of the river gravels. In any case, these eagle beak implements are of quite a new type.

Sir Daniel Morris, in proposing a vote of thanks to Sir Ray Lankester for his most interesting address, expressed the delight of the members at his acceptance of the Presidency of the Society, and said his lecture would doubtless be an event of very considerable importance as regarded the Society's future. Sir Daniel regretted that Dr. Ord had found it necessary to retire from the position of Chairman of the Council, but said the members would be glad to learn that this gentleman would still continue his interest as Chairman of the Geological Section. They hoped with this continuance of interest on the part of Dr. Ord and others that there would be a large increase in the membership, so that they might later be strong enough to approach the Borough Council and ask them whether they could not find a room or quarters or give a home to the Society either in the building now being erected at the Lansdowne or elsewhere. If they were powerful and showed that they were capable of doing good work in the interests of the people of Bournemouth, then he thought they would get what they wanted. They wanted a place for their very interesting collection of fossils, plants, etc., which at present was locked up in a small building in Granville Chambers, where hardly anyone wanted to see them. What they wanted to do was to start a small museum, and to that end they must get the assistance of the Borough Council. They had as Mayor a member of the Council of the Society, and that was an encouraging fact in connection with their want. If they all worked together they would make the Society of very great value, and it would be the means of attracting men like Sir Ray Lankester to Bournemouth, as residents of the place. And he was pleased to announce that their new President contemplated spending two or three months of the coming winter in Bournemouth. (Applause.) If they got men like Sir Ray

Lankester residing here and taking an interest in the scientific side of the community, they would be able to accomplish distinctly valuable service to the town.

Dr. Arthur Ransome, in seconding the vote of thanks, said that Sir Ray Lankester's father was a very kind friend of his when he (the speaker) was six or seven years of age. He was exceedingly glad to welcome as their President that gentleman's very eminent son.

The lantern was supplied by Bright's Stores, Ltd., and operated by Mr. Thomas.

Report of General Summer Excursions, 1912.

Cheddar Cliffs and Caves. The first General Excursion of the Season was held on Wednesday, May 29th, when about 50 members left Bournemouth West Station by the 9.40 a.m. train for Shepton Mallet, where brakes were in readiness to convey the party over the Mendips to Cheddar, a halt being made at Priddy for lunch. The Botanical Section was conducted by Mr. R. V. Sherring, who pointed out various plants of interest while crossing the Mendips. Near the head of the Gorge it was met by Miss Ida M. Roper, F.L.S., of Clifton, who, with Mr. Sherring, showed the various rare plants of interest, which were in beautiful condition and perfection of flower, whilst walking down the Gorge to the Caves.

The rest of the party went on to the Waterworks, where Dr. Ord delivered an interesting address on the Geological formation of the stupendous cliffs, which are magnificent and grand.

A visit was then paid to Gough's Cavern, with its stalactites and stalagmites, the remarkable and beautiful shapes and colours of which were greatly enhanced by electric lights. Time did not permit of a visit to Cox's beautiful cave.

The drive was then continued along the valley through Westbury to Wells for tea. Some of the members paid a hurried visit to the Cathedral and the Bishop's Palace. The journey was then resumed through Croscombe to Shepton Mallet Station and Bournemouth was reached at 8.27 p.m., after a day much enjoyed by all.

The New Forest and Somerley. An interesting excursion was made by 96 members to these places on June 5th. The party arrived at Ringwood about 11.40 a.m. and then drove to the Black Bar, the largest Tumulus in the New Forest. Owing to the approach over the moors being inaccessible, due to the recent rains, a detour was made up the hillside, which commanded a view of the Tumulus, where Mr. Brownen gave a brief address on the Barrow, etc. The party then drove down the Moyles Court Avenue to the Ellingham entrance to Somerley Park, and availed themselves of the kind permission of the Right Hon. the Earl of Normanton to visit his picture galleries and gardens. At the house they were received by his Lordship and conducted through the picture galleries, etc. The collection contains over 30 authenticated paintings by Sir Joshua Reynolds, including the painting of Mrs. Siddons as the Tragic Muse, paintings by Sir Thomas Lawrence, Gainsborough, Greuze, a little gem of Mrs. Siddons by Opie, and some Murillos.

The portrait of Napoleon by Le Fèvre is said to be the best likeness of him ever taken, and that of Nelson by Lucy with a

scroll attached to it signed by six of his officers, certifies to be a good portrait. Amongst the many interesting objects of art was a table of petrified wood made for King Charles II., which was afterwards in the possession of Marie Antoinette. The terrace gardens and grounds were then visited and admired, and the party then drove to Ringwood, where tea was provided at the Crown Hotel.

On the proposition of Sir Daniel Morris, it was resolved to send to his Lordship a special vote of thanks for his kindness in permitting the visit.

The party returned by the 6.40 p.m. train, after a very pleasant and interesting day.

Hartley University College.

On June 19th, by invitation of Dr. S. W. Richardson, the Principal of the Hartley University College, 41 members went by train to Southampton, where they were met by several Professors on the Staff. One section followed Mr. W. Dale, F.G.S., F.S.A., passing the site of the Castle and the arcaded Walls of the Old Town, visiting the Norman House or King John's Palace, the West Gate and St. Michael's Church, *en route* to the Guildhall. In the Audit Room a number of important and valuable records were laid out for inspection, and Professor Studer, Lit.D., M.A., of the Southampton Record Society, gave most interesting particulars of their contents, relating to old laws, the trade of the Port by sea and land, etc. Some of the most interesting exhibits were the framed Charter of King John, and the "Oak Book," containing the earliest records of the laws, ordinances, and customs of the Town, including the Laws of Oberon, the basis of all naval law.

Professor E. S. Lyttel, M.A., then showed God's House, a hospital used by the Huguenot pilgrims, and the Chapel containing the tombs of the Earl of Cambridge, Lord Scrope of Masham, and Sir Thos. Gray ,who were executed for treason by Henry V. in 1415.

The other section was conducted by Mr. Baldwin Wiseman, M.Sc., A.M.I.C.E., over the very large and important cold storage depôts at the Docks.

The whole party, after lunch, met at the Hartley University College, where they were received by Professor J. Eustice, and hospitably entertained at tea. A full and varied programme had been arranged for the visitors by the Principal and Staff.

The subjects were the Work of the Record Society, Curiosities of Ancient Arithmetic, Crystallisation, Rare Hampshire Plants, Ancient Water Supplies and Liquid Air. The last-named attracted the largest audience, and great interest was taken in the numerous and successful experiments. The effects of very low temperature on rubber, flowers, fruit and meat were shown. Carbon dioxide

was solidified, mercury was frozen and, from a rod of solid quicksilver bent into a hook, a fairly heavy weight was suspended.

Amongst the demonstrations may be mentioned that of the projection polariscope, the wonderful harmonographs, shown by Professor Watkin, and the fascinating display of stream-line motion in pipes and bends by Professor Eustice.

The members of the College Choral Society gave a vocal and instrumental concert in the Central Hall.

Before leaving, a cordial vote of thanks was given to the Principal and Staff for their hospitality and kindness, and the party returned to Bournemouth, after a memorable day, greatly enjoyed by all.

Cerne Abbas and Minterne. On July 6th an excursion was made to Cerne Abbas by 61 members, conducted by Mr. Harry Pouncy, Assistant Hon. Secretary of the Dorset Field Club.

Arriving at Dorchester at 9.35 a.m., they drove along the Cerne Valley, passing Poundbury Camp, the Roman hill-side aqueduct terrace, and Wolfeton House, of each of which the Conductor gave the history. At Charminster, the Norman Church with its late Perpendicular Tower, was shown by Archdeacon Dundas. On reaching Cerne Abbas the party was received by the Vicar, the Rev H. D. Gundry, and the 14th Century Abbey Barn, the Church, St. Austin's Well, and the very fine Gate House Tower were visited in turn. The party took shelter in the Abbey Farm House, by the kindness of Mr. and Mrs. John Diment, from a thunderstorm which lasted two hours, while Mr. Pouncy entertained and delighted his audience by narrating the history of Cerne and the legendary lore connected with it, and by singing songs in the Dorset dialect, a welcome compensation for the loss of a visit to Minterne House, the seat of Lord Digby, famous for its Flemish tapestries. The 15th Century Guest House, or Refectory, of the Abbey is in a precarious condition, the front wall, with a particularly beautiful oriel window, being much out of the perpendicular, but it will interest the members of the society to know that, owing to the intervention and exertions of Mr. Hy. Le Jeune, the Dorset Field Club has prevailed upon the owner, Mr. Pitt Rivers, to take effective steps to secure its preservation.

Heron Court. An enjoyable afternoon was spent on Saturday, July 27th, when, by the kindness of the Earl and Countess of Malmesbury, a hundred members paid a visit to Heron Court, where they were welcomed by the Earl and Countess to a garden party.

The visitors were divided into two groups and each, in turn, was conducted through a number of the principal apartments by the Earl, who explained the many priceless and ancient heirlooms of which he is the proud possessor. Among the many beautiful works of art and objects of historical interest, may be specially mentioned the large folding screen given by an Emperor of China to Catherine of Russia, and afterwards presented to one of the Earl's ancestors. It is of delicate and artistic Chinese workmanship, the Celestial characters being in Soapstone. In the Library, particular attention was drawn to the manuscript scores by Handel, a gift from the great Composer himself.

After seeing the principal objects in the Mansion, the party was taken on a tour of observation of the principal trees and shrubs in the Park, under the guidance of Sir Daniel Morris and Mr. Drake (Lord Malmesbury's agent). The Lebanon Cedars, the large-fruited Cypress, the South Californian pine, the Californian Redwood, the American Mammoth trees (Wellingtonia), and the Scotch firs being the most prominent amongst the many fine trees which adorn the place.

After enjoying the hospitality of their distinguished hosts, the party left for Bournemouth.

Bradford-on-Avon.

An excursion was made to Bradford-on-Avon on the 14th August. Thirty-three members left the Bournemouth West Station by the 8.37 a.m. train for Bath, where they were met by the Rev. H. H. Winwood, M.A., F.G.S., who kindly acted as conductor. The party drove through Batheaston and, crossing the old Ford by the modern bridge, passed Bathford on the left hand, and then ascended on to the plateau, from which a magnificent view was obtained of the Wiltshire Downs. The first halt was made at Kingston House, one of the finest Jacobean Mansions in the district, built by a Mr. John Hall, who settled here in the 17th Century. It is now the property of Mr. Moulton, and is in a splendid state of preservation.

The party then walked through the town to the ancient bridge spanning the river, with its curious domed structure built at the end of one of its piers. It is not certain what it was originally built for, Aubery, in 1670, mentions it " As a little chapel, as at Bath, for Mass "—it was probably used to receive tolls from passengers, and in more recent times has been turned into a lock-up.

After lunch a visit was made to the Tithe Barn at Barton Farm, with its fine old 14th Century timbered roof still in good preservation, supporting the shingle roof. It was formerly the property of the Abbey of Shaftesbury. At the farmhouse, the " Hall," the solar or day room of a chamber of the same date as the Barn, was next inspected. It was probably the residence of

the agents who received the rents and acted as managers of the Monastic property. The party then crossed over the quaint 14th Century Bridge, with its pointed arches, on its way to visit the Chapel up the steep ascent to Tor Hill, commonly called the "Tory Chapel" and dedicated to the Virgin Mary. It was erected over a spring called "Lady Well," which supplied the town with water. The fine tracery work in the east window indicate late 15th or early 16th Century work. It has been recently restored. A descent was then made to visit the Saxon Chapel. This Ecclesiola, William of Malmesbury writes, was built by Eoldhelm (Aldhelm), the founder of Malmesbury Abbey and afterwards Bishop of Sherborne, who died 709. Freeman, the historian, calls it "The one perfect surviving Old English Church in the land." Bloxam thinks it dates to the latter part of the 10th Century. The history of its discovery is of interest.

The late Canon Jones, vicar of the Holy Trinity Church close by, noticed the high pitch of a roof when looking down on it from Tor Hill, this led to further investigation, and the discovery of the Chapel. At that time the upper portion of the Nave served as a free school. The North Porch existed as at present, but the south side was hemmed in by modern buildings. These were cleared away, and the Saxon Church of St. Lawrence was opened on August 10th, the festival of the Saint, for Divine service.

Mr. Belben, F.S.A., of Belcome Court, then took charge of the party, and described the Parish Church of the Holy Trinity. It consists of a Nave with a North Aisle, Chancel, a Chantry at the south-east end of the Nave with a tower and low spire. There are traces of Norman work in the Nave and Chancel, the latter was lengthened eastward in the decorated period. A fragment of the rood loft, or gospeller's gallery, has been affixed to the west end of the Nave.

After tea at the Swan Hotel, the party returned to Bath via Farleigh Castle and the picturesque Limpley Stoke Valley, and left for Bournemouth by the 6.7 p.m. train, after a most enjoyable day.

Badbury Rings and Charborough Park.

About 74 members availed themselves of the kind permission of Lady Dunsany to visit Charborough Park on Wednesday, the 28th of August. On arrival at Wimborne at 10.57 a.m., they inspected the aviary of hardbills at Dr. W. H. Dodd's, of Wimborne, and then drove to Badbury Rings, where Mr. Brownen gave an address on this remarkable earthwork, which occupies the crest of an isolated hill about 300ft. above mean sea level. It consists of three ramparts and their ditches, enclosing a central area elevated above the inner rampart. Between the outer ramparts is a wider plateau than between the second and third, probably used for the protection of cattle, thus

permitting the inner area to be set apart as a place of refuge for the ancient inhabitants. The main entrance on the western front is singularly serpentine in character, the outer edge being defended by a bank or barbican, probably of Roman erection. The fortress is one of a chain of hill forts controlling the west bank of the Stour from its source to its outlet at Christchurch.

The drive was resumed to Charborough Park, passing through Sturminster Marshall. On arrival the party was met by Mr. G. W. Profeit, the agent to the Estate. One place of historical interest was the Ice House, with its underground chamber, where the plans were made for William of Orange to come to this country to assume the crown of England. The "Tower," which is about 100ft. high, can be seen for miles around, and is the one referred to in Thos. Hardy's novel, "Two on a Tower." The party was shown the picture gallery, the private chapel and the gardens. The Park, in which about 1,500 head of deer are kept, is very extensive. It contains many remarkably fine cedars and other trees.

After partaking of the kind hospitality of Lady Dunsany and tendering thanks to Lady Dunsany and Mr. Profeit for their kindness and courtesy, the party returned to Bournemouth by the 6.6 p.m. train.

Salisbury. The last General Excursion of the Season was made to Salisbury on September 18th, by 40 members. On reaching the Cathedral, Dr. Bourne conducted them over the edifice, pointing out the features of interest; among others worthy of notice were several old tombs, the beautifully carved choir stalls, the rich decoration of the roof, altar, reredos, and chantries, and the Chapter House, with its wonderful carvings of Old Testament story. After leaving the Cathedral, the party was received by Dr. Blackmore at the unique Museum of Antiquities and Natural History associated with his name, where he described the contents of many of the cases, and gave an interesting and instructive address on the history of ages long past.

Proceedings of Sections.

Archæological and Historical Section.

CHAIRMAN: G. BROWNEN, ESQ., F.C.S.
SECRETARY: H. LE JEUNE, ESQ.

Nov. 15, 1911. The first meeting of the Winter, or indoor, Session was held in Granville Chambers on November 15th, 1911. The Sectional Chairman gave a short review of the more important discoveries in Antiquities and corrections of History obtained during the past year. The claims of the centuriation or schedulizing the antiques of our own locality were again brought forward.

Jan. 11, 1912. A lecture, illustrated by the lantern, was given in Granville Chambers on "British Furniture, from the Anglo-Saxon period until the end of the 18th Century," by Miss F. M. Gardiner, a member of our Society.

Feb. 15, 1912. A lecture was given by the Rev. F. A. Allen, M.A., a member of the Society, in the rooms, Granville Chambers, on "The Proposed Exploration of Uriconium—a Roman City, near Wroxeter, Salop." A systematic examination of this important site was soon to be undertaken by antiquarian experts.

Besides these sectional engagements, there were lectures delivered in other Sections of great Archæological and Historical interest. These were:

Nov. 11, 1911. "The Most Ancient Evidences of Man in Europe," by the President, Sir E. R. Lankester.

Nov. 18, 1911. "Athens, Mycenae, etc., by the Rev. W. H. W. Cooper, M.A. (Geographical Section).

March 30, 1912. "Morocco," by S. Wood, Esq., F.C.A. (Geographical Section).

April 13, 1912. "Jersey," by Dr. G. E. J. Crallan (General).

May 4, 1912. "Jersey," by Dr. G. E. J. Crallan (Geological Section).

The Summer, or outdoor, Excursion Session commenced in May, and the Archæological Sectional Excursions were as follows:—

May 8, 1912. An Excursion to Arish Mell and Flowers Barrow, via Wareham. At Flowers Barrow a short paper was read by Mr. G. Brownen, the Sectional Chairman, on "The Recovery of Britain to the Roman Empire by Constantine Chlorus, A.D. 286—306."

June 19, 1912. Excursion to Southampton and the Hartley College, when various members of the College Staff conducted our excursionists round the town, and afterwards through the College, and entertained them to tea.

June 26, 1912. Excursion to Milton, Tuddiford and Milford. At Milton the ancient Moat was inspected and, on a rampart of Tuddiford Camp, Mr. Brownen indicated its structure and position in accordance with ancient landings and settlements. At Milford our excursionists were conducted over the ancient Church by W. Ravenscroft, Esq., F.S.A., who pointed out its principal architectural features, etc.

July 27, 1912. An Excursion to Heron Court, by the special invitation of the Right Hon. the Earl and Countess of Malmesbury. The Earl acted as the conductor over his mansion and subsequently entertained his visitors at tea and a garden party.

August 7, 1912. An excursion to Bisterne House, by permission of J. Digby Mills, Esq., J.P., who kindly conducted the visitors through his mansion and entertained them to tea. Mr. Brownen's paper upon Bettsthornes and Berkeleys, of Bisterne, will be found on page 94.

August 28, 1912. An Excursion to Badbury and Charborough Park. On the ramparts at Badbury Mr. Brownen gave a short history of this ancient camp. At Charborough an inspection of the mansion and its beautiful park was permitted, and Lady Dunsany kindly provided the visitors with tea.

Sept. 28, 1912. The last Excursion of the season was an afternoon visit to the Priory Church of Christchurch. The Vicar, Canon Cooke-Yarborough, kindly conducted the visitors over the Church. In the North Transept Mr. Brownen read a short paper upon "The Heraldry in the Church."

Besides these Sectional outings, the other excursions of the season of great Archæological interest were the following:—

May 14, 1912. To Corfe Castle, etc. A Botanical Excursion.

May 29, 1912. To Cheddar and Wells. A General Excursion with geology prominent.

June 5, 1912. To New Forest and Somerley Park, by kind permission of the Earl of Normanton.

July 6, 1912. To Cerne Abbas, etc. A General Excursion.

August 14, 1912. To Bradford-on-Avon. A General Excursion.

Sept. 18, 1912. To Salisbury Cathedral and Museum. A General Excursion.

The Excursions were generally favoured with fine weather, and not attended by any serious mishaps.

Botanical Section.

CHAIRMAN: MISS C. AGNES ROOPER.
SECRETARY: R. V. SHERRING, ESQ., F.L.S.

CHAIRMAN'S REPORT.

The Report of the Botanical Section is very satisfactory, which is chiefly owing to the unwearied interest and unfailing energy of the Hon. Secretary, Mr. R. V. Sherring, F.L.S. During the Session from November, 1911, to April, 1912, inclusive, weekly meetings were held in the Society's Room in the Granville Chambers, when the Herbarium was arranged and classified. The thanks of the Society are owing to Mr. H. Swain for the kind assistance he gave in the execution of this work, and for the time and trouble he put into it. The following Sectional Papers were read:—

November 9th. A paper was read by Miss Agnes Rooper on "The Effect of Decapitation on Foliage Leaves."

December 7th. In the Trinity Hall two papers were read. One by the Rev. Professor George Henslow, M.A., F.L.S., F.G.S., on "The Purposes of Plant Movements,

executed under the Directivity of Life"; the other, on "The Increase of *Colpomenia sinuosa* in Britain," by A. D. Cotton, Esq., F.L.S., Royal Gardens, Kew. (A summary of this appears on a later page of this volume.)

January 4th, 1912. A paper was read by the Rev. L. S. Garland, M.A., on "A Sketch of the Myxomycetes."

February 1st. A paper by Mr. Charles Parmiter, entitled "How Plants Manufacture Food Materials from Inorganic Substances."

April 18th. A lecture by Maurice Prichard, Esq., on "Alpine Plants under Culture and in the Native Haunts." The meeting was held in Trinity Hall.

Secretary's Report.

The Excursions of the Season, 1912, took place on the following dates:—

Tuesday, May 14th. Corfe Castle, Nordon, Bushey, and Brenscombe Wood, returning by Ashey Copse.
Wednesday, June 12th. Abandoned.
Wednesday, July 10th. Wool.
Wednesday, August 3rd. South Haven and Little Sea.
Wednesday, September 25th. Brockenhurst, Stockley and Hawkshill enclosure.

Four out of the five excursions arranged for were very successfully carried out, the fifth, to Creech Barrow, was prevented by one of the wettest days of the year.

These excursions were supplemented by the workers going on July 12th to Hinton Admiral, Highcliffe and Mudeford; on July 25th to Wareham and Stoborough; and on September 19th to Corfe Castle, Nordon and South Middlebere.

Advantage was also taken of General and other Sectional Excursions, *e.g.*, to Cheddar, Flowers Barrow, New Forest, Somerley, Southampton and Studland.

A considerable number of plants have been collected; more especially by individual work of the members. Excursions of the Section were greatly interfered with by the arrangements of the Railway Company in the earlier months of the year, and later by the abnormal or unseasonable weather.

Special attention has again been paid to the water and bog plants, rushes, sedges and pond weeds, lists of these we hope to insert in the volume next year, after verification. The most interesting find of the season was early in the year of *Equisetum hyemale*, by Mr. J. F. Rayner, F.R.H.S., and Miss M. Moore, near Southampton, being the first record of the county; also a very rare form of *Equisetum limosum*, c. *polystachion* (Bruck),

in Dorset, and a new locality for *Malaxis* by Mr. R. Vowell Sherring, F.L.S., are noteworthy. During August and September were seen abnormally fine flowers and growth of the four Heaths, caused by the rain just at the right time, viz., *Calluna vulgaris*, *Erica ciliaris*, *Tetralix* and *cinerea*, interspersed with *Ulex Gallii* and *U. minor*, and dotted about here and there with dark blue flowers of *Gentiana Pneumonanthe*.

The first Sectional Excursion was much enjoyed, as new ground was covered from Corfe Castle over Challow and Rollington Hill, Bushey Wood and Ashey Copse. The Botanical Secretary had prepared a list of plants found a few days previously which interested many in what they might expect to find. The Section greatly appreciated the Cheddar excursion, where many saw for the first time the rare plants growing in the gorge. The Botanists were conducted by Mr. R. Vowell Sherring, F.L.S., and by Miss Ida M. Roper, F.L.S., who kindly came from Bristol, and met the party at the head of the gorge. The Creech Barrow excursion, for which a goodly number of members applied for tickets, was stopped by the impossible weather, and the many rare plants were missed for the season.

Wool was the next place on the programme. The ground had been well worked beforehand, and members were well satisfied with the rare and pretty flowers obtained in the ditches, river, and wet marshes and lanes.

August 3rd. was devoted to South Haven and Little Sea. The members were greatly helped by the Rev. F. W. Galpin, F.L.S., who, with the Botanical Secretary, showed many of the rare plants of the locality. Early in the year Mr. Galpin had sent the Society *Primula elatior* from its locality in the eastern counties.

September 25th. The Fungus Foray took place in the New Forest, conducted by Messrs. Rayner and Sherring. The party (17 in number) proceeded by brake to Stockley and Hawkshill Plantation, meeting at a given point in the Forest, whence they proceeded to Fram Hill and on to Hawkshill, returning by a different route through Stockley to the carriages. Mr. Rayner then gave a final demonstration, and description of the Fungi which were named and exhibited on the table. A few species new to the district have been added to the list this year.

At the invitation of the Chairman, two working excursions were called to Hinton Admiral, Highcliffe and Mudeford, and to Wareham and Stoborough, both excursions yielding heavy "tins" and many fine specimens to the Herbarium. Much new ground has been covered both by excursions, by parties and by individual work of members.

Places visited include:—

Dorset.—Church Knole, Parkstone, Wool and Westfield Copse, Grande, Studland, Little Sea, South Haven, Swanage, Wareham, Stoborough, Flowers Barrow, East Lulworth, and Barnston.

Hants.—Christchurch Meadows, Highcliffe, Mudeford, Brockenhurst, Hawkshill, Hatchet Pond.

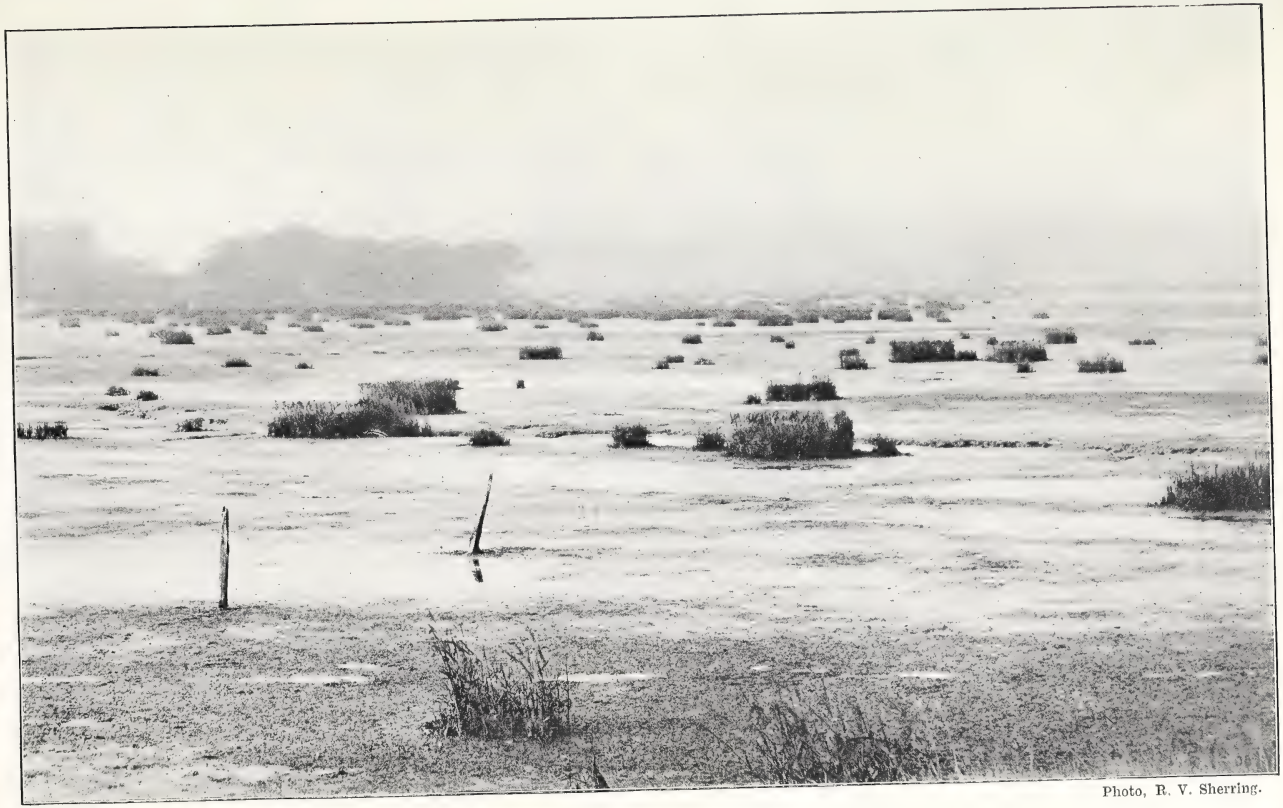
Isle of Wight—Totland, Freshwater, Colborne, Swainston, Yarmouth, Brook, Shanklin, Apse Heath, America, Hurn.

Also Throop, Red Hill, Cheddar, Bradford-on-Avon.

The arrangement of the excursions was left in the hands of the Botanical Secretary during the Chairman's absence abroad.

List of Plants Collected during the Session.

4 Thalictrum minus, Linn. (Lesser Meadow-Rue)
30 Ranunculus Lingua, Linn. (Great Spear-wort)
36 ,, parviflorus, Linn. (Small-flowered Crowfoot)
62 Meconopsis cambrica, Vig. (Yellow Welsh Poppy)
67 Corydalis claviculata, DC. (White Climbing Fumitory)
114 Cochlearia officinalis, Linn. (Common Scurvy-grass)
159 Teesdalia nudicaulis, Br. (Naked-stalked Teesdalia)
163 Cakile maritima, Linn. (Purple Sea Rocket)
196 Dianthus glaucus, Huds. (Cheddar Pink)
290 Althaea officinalis, Linn. (Marsh-Mallow)
296 Malva rotundifolia, Linn. (Dwarf Mallow)
317 Geranium rotundifolium, Linn. (Round-leaved Crane's Bill)
319 ,, columbinum, Linn. (Long-stalked Crane's Bill)
425 Lathyrus montanus, Bernh. (Tuberous Bitter Vetch)
554 Geum rivale, Linn. (Water-Avens)
650 Tillaea muscosa, Linn. (Mossy Tillaea)
658 Sedum dasyphyllum, Linn. (Thick-leaved Stonecrop)
1158 Microcala filiformis Hoffmgg. & Link (Gentianella)
1203 Calystegia Soldanella, Br. (Sea-side Bindweed)
1531 Malaxis paludosa, Sw. (Bog Orchis), new locality
1598 Asparagus maritimus, Mill. (Asparagus)
1604 Simethis planifolia, Gren. & Godr. ("Bournemouth Lily")
(Rediscovered by Messrs. Sherring and Backhouse.)
1632 Paris quadrifolia, Linn. (Herb Paris)
1656 Luzula Forsteri, DC. (Narrow-leaved Hairy Wood-Rush)
1657 ,, pilosa, Willd. (Broad-leaved Hairy Wood-Rush)
1685 Butomus umbellatus, Linn. (Flowering Rush)
1718 Ruppia maritima, Linn. (Greater Tassel-grass)
1719 ,, rostellata, Koch. (Lesser Tassel-grass)
1737 Scirpus nanus, Spreng. (Small Club-Rush)
1841 Spartina Townsendi, H. & J. Groves (Intermediate Cord Grass)
1869 Polypogon monspeliensis, Desf. (Annual Beard Grass)
2005 Polystichum aculeatum, Roth. (Prickly Shield Fern)
2007 Lastrea Thelypteris, Bory. (Marsh Fern)
2018 Phegopteris Robertiana, Braun. (Limestone Polypody)
2022 Ophioglossum vulgatum, Linn. (Common Adder's-tongue)
2030 Equisetum sylvaticum, Linn. b. capillare (Hoffm.)
(Branched Wood Horse-tail)
2032 ,, limosum, Linn. (Smooth Water Horse-tail)
,, b. fluviatile, Linn forma polystachyum
2033 ,, hyemale, Linn. (Great Rough Horse-tail)
2036 ,, variegatum, Schleich. (Variegated Rough Horse-tail)



Photo, R. V. Sherring.

Spartina Townsendi in Poole Harbour.

Photo, R. V. Sherring.

Spartina Townsendi in Poole Harbour.

Spartina Townsendi.—H. & J. Groves.

Intermediate Cord Grass.

It may be useful to mention that this grass has received much attention in the neighbourhood of Lymington and in Southampton Water. Dr. Stapf, F.R.S., of Kew, has been a constant observer and with his valuable assistance much useful work has been done in the districts above mentioned as well as in Poole Harbour. References to the literature are given at the end of this note. The observations by members of the Bournemouth Natural Science Society have, naturally, been confined to Poole Harbour and adjacent creeks, and it is to these localities that the following remarks apply.

The numerous dots in the mud to be noticed last year (1911) are now becoming bunches of grass, the bunches are patches, the patches belts, and so on to acres. A very marked example is a belt of the bunches that show like little islands at high water, and run from the shore a little west of Rock Ley Railway Bridge towards Arne shore and the Wareham Channel. To the west of these, two fresh large patches are forming and this is the most marked example noticed of actual increase in a new part. To realize the heart of the matter of extending growth it must be inspected at Wych and Ower Bay on the South of the Harbour, while after passing Newton Bay and Goatshorn in Brands Bay, lying to the eastward, the luxuriant growth decreases to similar patches, bunches and dots seen in the mud at Red Horn Quay, and these become even less in Bramble Bush Bay, a fact that should be well marked this year for further observation. It seems probable that this pretty spiked grass has a preference for the creeks watered with little streams lying on the southern shore of the Harbour.

A good idea of the whole situation can be grasped by taking train to Corfe Castle and going about a mile along the Down to the eastward. For choice a time of low water and a western sun should be taken, and then with a clear day, and the help of powerful field glasses and a 6-inch ordnance map a visitor will see in a quarter of an hour most of the various increases that it has taken hours and days to find out by repeated visits to the grounds.

I am quite in agreement with Mr. Brown that Long and Round Island are now practically connected by the grass at the time of low water.

First Record, H. & J. Groves, 1878.

Journal of Botany, xi. i 1882 (with plate), S. stricta var H. & J. Groves. *Journal of Botany*, viii, 277, Townsend's Cord Grass.

Townsend's *Flora of Hants*, 1904, page 479.

Gardeners' Chronicle, vol. xliii., Third Series, 1908, page 33.

Tansey: *Types of British Vegetation*, 1911, page 337.

Geographical Section.

CHAIRMAN: GEORGE DE CASTRO, ESQ., M.R.C.S., Eng., &c.

An average number of meetings has been held in this Section during the year 1911—1912. One of them, however, was in conjunction with the Physical Section, and all of them have had the advantage of being illustrated with excellent photographic views and maps.

Only a single Sectional Excursion could be arranged during the Summer Session, but that was organized as a purely Geographical one.

WINTER SESSION.

Athens, Mycenæ, Patmos and Rhodes. 18th November, 1911. The Rev. W. H. Windle Cooper, M.A., F.R.G.S., delivered a lecture on "Athens, Mycenæ, Patmos, and Rhodes," in which the sites of many of the ancient cities, and remains of buildings in these various districts were described, and some of the most beautiful architecture in Athens itself, and in other parts of Ancient Greece was depicted.

The Aletsch Glacier. 20th January, 1912. This was a joint meeting of the Geographical and Physical Sections, and the Lecturer, Gerald H. Sulivan, Esq., B.Sc., gave a description of "A Holiday near the Aletsch Glacier," which was of special interest, because it described a series of visits to that part of the Bernese Alps, and the changes which had been noted in the position of the glacier at different dates. The second part of the lecture, in reference to the "Properties of Ice, and the Problems of Glacier Movement," will be noted in the Physical Section.

Modern Geographical Methods. 17th February, 1912. At this meeting a paper, entitled "Some Thoughts on Modern Geographical Methods" as applied to the teaching of geography, was read by W. J. Woodhouse, Esq, and was of a more technical character than usual, pointing out the importance of geography, and of its being taught in a scientific manner, as also that Physical Geography formed perhaps the best basis of instruction.

Specimens of some apparatus made, and of diagrams designed by the reader for teaching purposes were exhibited; and the paper was followed by a short discussion.

Morocco. 30th March, 1912. The use of Trinity Hall was granted by the Council for the delivery of a lecture on "Morocco of the past and of To-day," by Samuel Wood, Esq., who showed that the early immigration of savage peoples into Northern Africa had been followed by that of the Phœnicians, the Greeks, and the Romans, and how the Vandals had crossed from Spain into Roman Africa, while later the Arabs had invaded Europe, and, with the Berbers and Moors, had occupied Spain for many centuries, and yet the Moors of to-day had lost their former civilization, while their country, with the greater part of the South Mediterranean Coast, was gradually becoming colonized by the modern Latin Races of Southern Europe.

SUMMER SESSION.

Visit to Southampton. 11th September, 1912. Arrangement had been made, through the courtesy of the Director-General of the Ordnance Survey Office, to allow of a visit to the Government Department at its headquarters at Southampton, and the Chairman of the Section provided the members who formed the party with a compilation of notes giving the history, progress and work of the O.S. of the U.K., from the date of its origin, about the middle of the 18th Century.

On meeting in the Library, in which were laid out for inspection a series of large and small scale O.S. maps, as well as the engraved plates from which they had been printed, a short description of the processes used in their production was given; this was rendered all the more interesting as maps had been selected which represented the district of Bournemouth more especially, while to these had been added some Geological maps of West Hampshire and of Dorsetshire.

The party was then divided into three sections, each one being led through the following departments by one of the officers of the R.E. staff, by whom the work in each was most lucidly and fully explained:—The Drawing, and the Electro-typing Departments; the Photographic Department, with the Helio-zincographic and Vandyke Processes of reproduction; the Printing and Colouring Department; the Trigonometrical and Levelling Department; also the inspection of Bars and Standards of Length, which are carefully preserved in special buildings constructed for the purpose.

With this last Department the tour of inspection, in which everything seen was of very great interest, came to an end.

Three of the General Lectures delivered to the Society during the Winter Session were of special Geographical interest: The

Lecture by Dr. Vaughan Cornish, on "The Progress of the Panama Canal"; that by Claude Lyon, Esq., illustrating "Some of the Natural Wonders of the U.S. of America"; as also the one by George de Castro, Esq., on "The Physical Geography of New Zealand."

Geological Section.

CHAIRMAN: DR. WILLIAM T. ORD, F.G.S.

The Pyrenees. The Winter Session in this Section opened on November 22nd, 1911, when a paper was read by Dr. Colley March, F.S.A., Vice-President of the Dorset Field Club, entitled "Odds and Ends from the Eastern Pyrenees—Geological, Glacial, Neolithic." After a brief description of some of the leading geological features of this mountain range, Dr. March described a neolithic floor which he had discovered, and exhibited various objects of human workmanship found there. Some account of the glaciation of the district was also given, and some geological and other specimens were shown.

Flints. On December 16th, 1911, a lecture was given by the Chairman of the Section on "The Origin and Formation of Chalk Flints." This was illustrated by lantern slides of micro-photographs from sections of various kinds of flint and chert, which had been lent by Mr. William Hill, F.G.S., late President of the Geologists' Association, and used by him to illustrate his presidential address to the Association in February, 1911. Dr. Ord explained that Mr. Hill's address on Flint and Chert * gave the latest views as to their origin and formation, and it was frequently referred to in his lecture. A number of microscopic sections of flints were shown, also hand specimens of various types from the neighbourhood, as well as from Dr. Ord's collection and the cabinet of the Society.

The Chalk Sea. On January 18th, 1912, a lecture was given by Mr. H. St. Barbe, of Lymington, on "The Chalk Sea." This was of special interest, both for the clear account given of the geographical and physical conditions under which the present chalk formation was produced, and also in reference to the previous lecture by the Chairman on flints. Mr. St. Barbe showed various diagrams illustrative of his subject.

Jersey. On May 4th, 1912, a paper on the Geology of the Island of Jersey was read by Dr. G. E. J. Crallan, Dr. Ord being in the chair. The paper was illustrated

* Proceedings, Geologists' Association, vol. xxii. part ii. 1911.

with lantern slides and hand specimens of all the various rocks described were shown and passed round for inspection. A large coloured map showing all the various formations was exhibited.

The Bournemouth Cliffs. The first geological excursion, May 15th, consisted of a walk along the beach from the Zig Zag to Boscombe, conducted by the Chairman. Owing to the progress of construction of the new Undercliff Drive this was considered to be the last opportunity members of the Society would have of examining the geology of this most interesting section of the magnificent exposure of Eocene strata that extends round Bournemouth Bay. It consequently excited much interest and was largely attended.

Studland. On May 18th, Mr. C. Carus Wilson, F.R.S.E., F.G.S., joined the Chairman in taking a party around Studland Bay, from the Sandbanks to the coloured cliffs of Bagshot Sands at Studland Beach, also with the intention of examining the junction of the chalk of Ballard Down with the Eocene Beds, and the interesting stack formations of Old Harry Rocks. Approaching Studland the well-known " musical sands " were found, and Mr. Carus Wilson, whose discovery of these sands and researches into their properties first brought them to the notice of science, gave a practical demonstration of their sound-productiveness. At its conclusion rain fell, which at once put an end to the " musical " properties of the sand, and also unfortunately prevented further field work for the day. During a wait of some duration in the refreshment room on the beach, Dr. Ord gave a lecture on the geology of the district, and Mr. Carus Wilson gave further experiments with sands. The party returned by motor-boat to the Haven, having had to abandon quite half their programme.

The Wealden Strata of Brooke. An important excursion to the Isle of Wight took place on July 13th. Arriving by steamer at Yarmouth the party were met by W. G. Colenutt, Esq., F.G.S., of Ryde, the well-known geologist of the Island. Driving from Yarmouth to Brooke Mr. Colenutt took the members a walk westward along the coast, passing in order the Wealden Shales and clays, where the so-called " pine raft " was well exposed on the foreshore, and some good pieces of slicified wood-stems of conifers, were obtained for the Society's collection. Next the well-known alluvium deposit of Slippard's Chine was examined, and hazel-nuts obtained. The walk was continued to the junction of the Lower Greensand and Gault, after which the party returned to Brooke, where an enjoyable tea was provided, and the drive back to Yarmouth followed. A hearty vote of thanks to Mr. Colenutt for his interesting and

lucid account of the geological features of the various deposits examined in the cliffs, was passed, and members arrived at Bournemouth Pier from Yarmouth about 8.30 p.m. The party numbered 28—three members who omitted to land at Yarmouth were carried round the Island.

The Oligocene Strata of the I. of W.

On August 31st an excursion was arranged to Totland Bay, under the direction of Mr. H. St. Barbe, of Lymington. Arriving by steamer at 11.30 a.m., Dr. Ord, with some twenty members, were met by Mr. St. Barbe, who from the pier head gave a brief resumé of the coast section there displayed. Proceeding south along the shore the Lower Headon Beds were first examined at Widdick Chine and the base of Headon Hill. Some fine specimens of the thin limestone with *Paludina* were there obtained. Retracing their steps the party returned to Totland and thence—after a pic-nic lunch—to Warden Point, passing the several sections of the Lower and Middle Headon in ascending order. At Lynchen Chine a remarkable distortion of the strata, consisting of a combined thrust fault and anticline was photographed by Mr. Jeffreys, who has kindly presented an enlargement to the Society. Turning inland, an exposure of the Osborne and St. Helen's series was examined and some of the so-called turtles' eggs were found. Descending to the beach at Norton the Bembridge Marls were found, and the excursion terminated at Yarmouth, where a welcome tea was enjoyed. The return to Bournemouth was from Yarmouth Pier at 7.30 p.m.

Corfe and the Purbeck Hills.

The last excursion of the season, on September 21st, was in some respects the most successful. Over forty members attended. Dr. Ord conducted the party to East Hill, from which a magnificent view was obtained of the Purbeck area, and whence the members looked down upon the remarkable chalk monticle on which Corfe Castle stands. Here an address was delivered by the Chairman on the geology of the district displayed before them, aided by several maps and diagrams. After a pic-nic lunch, the debated subject of the geological origin of the Corfe hill was opened by Dr. Ord, who described several theories, laying special stress on that of the late Mr. Huddleston as the most probable, and which he ventured to supplement as to the mode of the formation of the double gap. An interesting discussion followed, in which Dr. Colley March, Mr. St. Barbe, Captain Elwes, and others took part. After this several pits were visited, the first of curiously hardened chalk gravel, the second showing the junction of the Chalk and Upper Greensand. Proceeding over the brow of the hill, two quarries in the upper zones of the chalk attracted attention, in which numbers of Calcite Crystals were found. Dr. Ord explained that his attention had been drawn to these by Mr. Carus Wilson, and that they

were extremely rare in chalk, though common enough in ordinary limestone. It seemed probable that they only occurred when chalk rock had been heated, as had the chalk in this part by the great thrust fault of the Isle of Purbeck. The carbonic acid gas being driven out of the water (with which the chalk was saturated) by this heat engendered by great earth movements, the lime was deposited out of the water very slowly just as fur formed in kettles, only in the form of crystals in cavities in the rock. After walking round the Castle rock, and examining the nearly vertical dip of the strata, some of the party inspected a large slab of Purbeck stone having some reptilian bones exposed on it. A whip round being held this was purchased from the owner, and is now in the Society's collection. Tea was taken at the Banks Arms.

Both meetings and excursions were very well attended in the past session, the numbers greatly exceeding those present in previous years.

Many valuable geological specimens have been added to the Society's collection during the past year. Amongst those who have presented gifts are Mr. Sherring, Mr. Carus Wilson, Mr. St. Barbe, and other friends. Dr. Ord gave a fine series of Carboniferous Corals and Mollusca from the west of Ireland, also a number of leaves from the Bournemouth Cliffs. Unfortunately quite two-thirds of the collection is packed in cases and cannot at present be displayed or examined. Until larger premises are provided, and some accommodation suitable for museum purposes obtained, this unsatisfactory condition of affairs must continue.

Zoological and Microscopical Section.

CHAIRMEN: DR. CRALLAN, M.A., M.B., and H. B. WELLS, ESQ., F.R.M.S.
SECRETARY: J. OMER COOPER, ESQ.

6th Jan., 1912. A meeting was held at Granville Chambers, at which the chair was taken by Mr. Wells. Organisms found and mounted during 1911 were exhibited and described by the Chairman and other members.

The Chairman first exhibited *Caprella erethizon*, found at Swanage. This Caprella was mentioned in the proceedings of the Natural Science Society for 1908-9, as having been found at Totland Bay and Swanage by Mr. Waddington. It was originally met with off the coast of Normandy, and was named and described by Dr. Paul Mayer, of Naples, in 1882, it being a new species. Very few specimens (only 4 or 5) had been found until it was met with at Totland, where it is now fairly abundant. As it has been found by the Chairman and Mr. Cooper at both Totland Bay and Swanage, it would seem to be establishing itself in Bournemouth Bay.

The next slide was one of the larvæ of the crab, *Porcellana platycheles*; remarkable for the long spines of the carapace.

Then *Chelura terebrans* and *Limnoria lignorum* were shown and their destructive habits described. Mr. Wells then showed a crab with the parasite *Sacculina carcini* attached, and gave the life history of the parasite.

Mr. W. J. Chaffey exhibited and described a rare entomostracan, *Polyphemus pediculus*, and some rotifers of the genus Asplanchna.

Mr. W. Parkinson Curtis, F.E.S., then exhibited *Eurota selva* H.L., a rare Syntomid moth from South America, the two shown being, as far as he could ascertain, the only specimens at present available for examination. The identity had been determined by Sir G. F. Hampson and Professor C. B. Poulton. Mr. Curtis expressed a doubt whether the insect should be allowed to remain in the genus Eurota, as is exhibited what, for a Syntomid, was the extremely aberrant character of vein 8 in the hind wings. He made some remarks on the gradual disappearance of this nervure as one progressed from the less highly developed Arctiedæ to the more highly developed Arctiedæ and to the Syntomidæ, supposed to have been derived from the latter.

Mr. J. Omer Cooper showed a young salmon (*Salmo salar*), and described its living, for the first six weeks of its life, on the yolk-sac. He also exhibited a slide of *Platyarthrus Hoffmansegii* an Isopod which inhabits the nest of the amber coloured ant, *Lasius flavus*. It is white and entirely blind, a character probably caused by living entirely in ants' nests, as the species is evidently derived from ancestors possessing eyes.

3rd Feb., 1912. A paper was given by T. B. Goodall, Esq., F.R.C.V.S., F.L.S., entitled "With the Whalers at Durban." Various exhibits were used by way of illustration.

25th April, 1912. A paper was read by W. Parkinson Curtis, Esq., F.E.S., "On Order and Method in the formation of Collections of Insecta and Aves." The paper is printed on page 71.

25th May, 1912. An Excursion to Poole Park was made, and many interesting forms of pond life were found.

29th June, 1912. An excursion was arranged to the ponds near Queen's Park and, by kind permission of Mr. Cooper Dean, the members visited the ponds in his private park, where a fine collection of Rotiferæ was made. The party then proceeded to the pond in Shiphouse Lane, where many specimens of pond life were obtained. Afterwards Strouden's pond was visited, but proved disappointing.

30th July, 1912. A dredging excursion to Poole Harbour and Studland was arranged. Only three members attended, and nothing of special importance was found.

24th Aug., 1912. An excursion was planned to Swanage to work the rock pools at Peveril Point. Owing to the rough weather the steamboats were unable to run, and the excursion had to be abandoned.

25th Sept., 1912. The Zoological Section joined the Botanical Section in an excursion to the New Forest, and visited Hatchett's Pond. A very pleasant time was spent by the members who worked this splendid pond, and their labours were well rewarded. Unfortunately, Mr. Waddington was prevented from joining the expedition, but some of the collection was taken to him, and we are greatly indebted to him for his report on the finds, and for his notes on other work during the year, 1912.

Mr. Omer Cooper also worked out very carefully his collection from Hatchett's Pond, and has given the following list of his finds:—

ENTOMOSTRACA.

Suborder. Cladocera.

Sida crystallina
Ceriodaphnia reticulata
Simocephalus vetulus
Bosmina longirostris
Eurycercus lamellatus
Alona reticulata
Peracantha truncata

Mr. Waddington, F.L.S., writes:—"The portion of the gatherings from Hatchett's Pond and the neighbouring pools, which were handed to me contained much interesting material. In addition to the objects usually found in this locality, there were many Algæ, notably, the two forms, *Glœotrichia pisum* and *Glœotrichia natans.*

Among the Infusoria were some large masses of *Ophrydium versatile*, which is somewhat rare. The pools abound with Entomostraca. A single specimen of *Graptoleberis testudinaria* was found. This adheres very firmly by the ventral surface, and is removed with difficulty. It is easily overlooked. Three or four species of Planarians were abundant, many containg ova.

In a gathering from Ringwood, brought by Mr. J. W. Chaffey, were many varieties of unicellular algæ, also the Entomostracan, *Scapholeberis mucronata.* Mr. Chaffey has again found the rare Rotifer *Pedalion mirum.*

Probably the most interesting find of the year was that of *Chirocephalus diaphanus.* This, when found, is usually "made a note of." It was met with after long and patient search by Mr. A. J. Rainer in three or four pools some miles from Christchurch.

Although Mr. Rainer does not belong to our Society, he has most kindly shared his finds with some of our members. I have had the pleasure of forwarding some specimens to the Natural History Museum at South Kensington, where they have been much appreciated.

The Chirocephali were obtained in such a condition that it was comparatively easy to work out the life history from the ovum to the adult animal.

It will be in the recollection of many of the members that some months ago an article appeared in "Knowledge," by Dr. Calman, on the development of the Brine Shrimp (*Artemia salina*) from ova remaining in Tidman's Sea Salt. If eight ounces of this salt is dissolved in five pints of ordinary water, in about five days, very minute larvæ are to be found actively swimming in the brine. Many experiments were made, here and elsewhere, and although any quantity of larvæ could be produced, all were females; no male could be found.

Through the kindness of my friend, Mr. John Pullman, of Parkstone, I obtained specimens of sea salt (similar to Tidman's) from Trepani in Sicily, and Mahdia in Tunis, where it is largely manufactured for the purpose of fish curing. On placing some of the Trepani salt in solution, as above mentioned, there were found three male Artemiæ, but no females. One of these was sent to South Kensington, one to our President (Sir Ray Lankester), and the third I hope to have an opportunity of showing to our members at some future time.

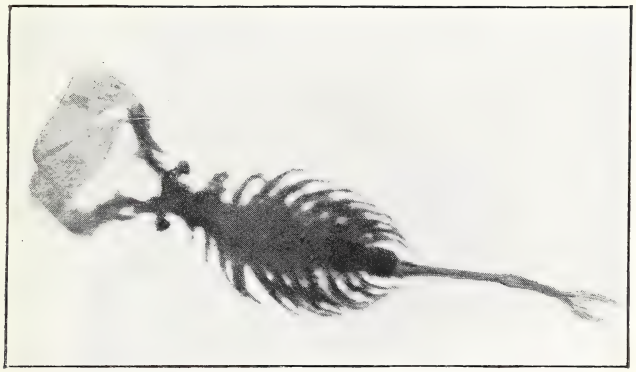
Artemia and Chirocephalus belong to the order Phyllopoda, or leaf-footed, animals, and in the earlier stages are much alike. Although the former, which used to be found in the brine pits at Lymington, has become quite extinct in England, it is a somewhat happy coincidence that at the time I was working at the one the other should have been brought to me by Mr. Rainer. It is interesting to note that in July last large quantities of the so-called Portuguese man-of-war (*Physalia pelagica*) appeared in Bournemouth Bay. Occasionally isolated specimens are brought by the Gulf Stream to the more southern coasts of England, but it is very rarely that they appear in such profusion.

Photographical Section.

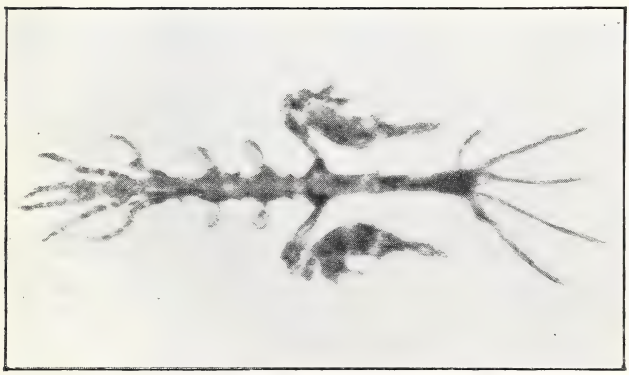
CHAIRMAN: E. W. BARLOW, ESQ., F.R.A.S.
SECRETARY: MISS E. HAWKER.

A.P. and P.N. Prize Lantern Slides.

Four Sectional Meetings have been held. The first of the Session took place on December 14th, 1911, in Granville Chambers, when the "Amateur Photographer and Photographic News" Prize Lantern Slides for 1910 were shown by the Chair-



Artemia Salina.



Caprella Erethizon.

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man, and the description supplied with them read. The slides, over a hundred and seventy in number, represented some of the best English lantern slide work for the year in question, and embraced both pictorial and record pictures of all types—landscape, architecture, natural history, archæology, etc.

Pictorial Composition. On January 25th, 1912, the Chairman delivered in Granville Chambers a lecture on "Pictorial Composition, with special reference to Photographic Work," illustrated by lantern slides. The lecturer dealt first with composition as a canon of art, and then briefly discussed the functions and limitations of art-canons. Coming to the more immediately practical part, the various simple types of composition, or framework, and afterwards those of greater complexity, on which pleasing pictures are built up, were described and illustrated by photographs and line diagrams. Reference was made, in conclusion, to the special relation of composition to photographic work.

Historic Homes of Old England. On March 25th, 1912, a combined Sectional lecture (Archæological, Historical and Photographical) was given in Trinity Hall, Lorne Park, by R. Y. Banks, Esq., the subject being on "The Historic Homes of Old England." The lecture, which was of great interest, dealt chiefly with the half-timbered houses of the 15th Century, though a few other buildings were also included. Many photographs were shown, the examples being selected from all over England.

A.P. and P.N. Prize Lantern Slides. On April 20th, 1912, the "Amateur Photographer and Photographic News" Prize Lantern Slides for 1911 were shown, in Granville Chambers, and the description read by the Chairman. The meeting was exactly analogous to that of December 14th last, above mentioned, but with the newer set of slides.

There have been no exclusively photographic excursions during the summer. The portfolio of photographs has continued to circulate.

Physical Section.

CHAIRMAN: HUBERT PAINTER, ESQ., B.SC., F.C.S.
SECRETARY: CHARLES J. PARMITER, ESQ.

During the Session 1911—12 the Physical Section held four meetings at Granville Chambers, and engaged in two excursions.

Glacier Ice. The first meeting, held 20th January, 1912, was in conjunction with the Geographical Section, and is referred to in its report. The Lecturer, Mr. Gerald H. Sulivan, B.Sc., gave an account of the physical properties of ice, and the Chairman drew the attention of the meeting to the new and remarkable forms of ice that have been discovered by Tammann.

The Conservation Movement. On March 2nd, Mr. Baldwin Wiseman, M.Sc., of Hartley University College, gave a lecture on "The Conservation Movement at Home and Abroad." Mr. Wiseman is one of a band of enthusiasts who are keenly alive to the way in which natural resources (coal, timber, etc.) are being squandered, and who are desirous of arresting, by the forces of public opinion and legislative enactment, an extravagance which, they think, threatens to bring our modern civilization to the verge of bankruptcy.

The Solar System. On March 14th, Mr. C. J. Parmiter read a paper on "The History of the Solar System," illustrated by a number of lantern pictures. An able sketch was given of a large and difficult subject.

Wireless Telegraphy. On April 11th, Mr. Percival J. Parmiter lectured on "Practical Radio-Telegraphy." The lecture was a sequel to one given in the previous Session on "The Principles of Radio-Telegraphy." The Marconi Wireless Telegraph Co., Limited, kindly lent a number of lantern slides. Mr. Parmiter is a keen student of this subject, and had taken much pains to acquaint himself with its latest developments.

Excursion to Burley. On May 11th about 30 members of the Section drove to Burley, in the New Forest, on the invitation of Lady Baker, who received her guests with great cordiality. After inspecting an interesting old cottage and the modern house, known as Forest Garden, the visitors examined an interesting collection of the products of the new terra-cotta industry which Lady Baker has established, and listened to a graphic account of the experiments which, after many failures, led at length to success. Within the house were examples of the excellent effects of the new ceramic products, "Dorset Marble" and "Oxidine," as applied to the decoration of staircases, walls, fireplaces, etc. Besides beautifully tinted tiles, such articles as vases, pots, bowls, etc., are produced at the works, which are at Keysworth, near Wareham. After the inspection tea was served in the hall and other rooms of the house. A vote of thanks to Lady Baker was proposed by the Chairman of the Section,

and seconded by Dr. Shillitoe, and the party returned to Bournemouth after one of the most successful excursions the Section has ever enjoyed. The weather was perfect, and there was no hitch in the arrangements made by the Sectional Secretary.

Visit to the Electric Light Works. On July 3rd there was a sectional excursion to the Electric Light Works at Bourne Valley. The invitation came from the Directors of the Bournemouth and Poole Electric Supply Company through Mr. Edgar Ingram, M.Inst.C.E., the Chief Engineer. That gentleman, with the assistance of several of his staff, showed the party, numbering about 30, over the works, and gave brief chats on the various processes employed. We were again favoured with fine weather, and the excursion proved a distinct success.

A Selection from the Papers read before the Society.

COLPOMENIA SINUOSA.

A New British Seaweed.

By A. D. Cotton, Esq., F.L.S., Royal Gardens, Kew.

(Read before the Botanical Section, December 7th, 1911.)

THE Seaweed, *Colpomenia sinuosa*, is one that readily lends itself to study in the field, and concerning which further observations are needed. It was first recorded from the British Isles in 1908, having been noted at Swanage and Torquay the previous season; but it has been subsequently learned that the plant appeared in the Scilly Isles in 1905. Since 1908 it has spread with great rapidity along the South Coast of England, and often occurs in the greatest profusion. It is now known from many localities in S. Cornwall, S. Devon and Dorset, but has not been recorded further east than Poole Harbour.

Description and Ecomonic Importance.

Colpomenia is a member of the Phæophyceae, or "Brown Algæ," and consists of a bladder-like frond (thallus) about the size, when full grown, of a greengage or small apple. This normally contains water, but when, as often happens, the fronds

are pierced at the base, the water escapes during low tide, and air is liable to take its place. On the return of the tide all the air is not expelled, but a certain amount remains as a bubble, which causes the frond to become bouyant. Many plants, owing to the presence of this imprisoned air, break away from their moorings, and frequently bring with them a piece of other seaweed or a minute fragment of rock. In Brittany Colpomenia has caused the loss of young oysters, owing to its rising to the surface in this way. The plants occur in great quantity on the oyster-beds, and when the fronds become buoyant and break away, they are apt to detach with them some of the spat or young oysters.

Habitat.

Colpomenia occurs on rocky shores, where there is shelter from rough water. It is found in autumn, winter and spring, but is most abundant in April and May. After June it practically disappears. It frequents pools and rocks near low-water mark. At Swanage it is found on the rocks below the Grosvenor Hotel, and at Weymouth in the pools south and west of the Nothe Fort. At Studland it is abundant on the rocks leading to the Old Harry Rocks, but in all cases search must be made at low tide.

Further Information Required.

Further observations are needed on the distribution of Colpomenia in Britain. Its luxuriance and rapid spread in Devon and Dorset lead one to expect that it will invade Hampshire and Sussex, but so far no one has recorded it from these counties. Notes on this point are important in connection with the possibility of its spreading through the Straits of Dover and finding a suitable habitat on the oyster beds of Kent and Essex. Being a southern plant, it is possible that the water of the North Sea may be too cold for its requirements, but as some of the largest specimens on record have been found at Studland, it is evidently quite at home in the waters of the Channel. Though abundant in the Scilly Isles, no records exist from N. Cornwall or N. Devon.

The Island of Jersey from a Natural Science Point of View.

By Dr. G. E. J. Crallan, M.A.

(Delivered as a General Lecture at Trinity Hall, April 13th, 1912.)

WHILE spending the past winter in Jersey it occurred to me that some account of the Island, with illustrations, might be of sufficient interest to form the subject of a lecture before our Society. This Island is a perfect little Kosmos in itself, but the time at my disposal will not allow me to give an account of the

history, politics, customs, folk-lore, etc., peculiar to Jersey, deeply interesting as they are, so I propose to tell you something of the Island from a Natural Science point of view, and to show you some pictures of the scenery, the architecture, and the antiquities of the Island. I hope in this way to interest members of each of our sections. As many of you may have a somewhat hazy idea of the geography of the Channel Islands, I will commence with a few remarks on their position and relations.

Geography.

The entrance to the English Channel, about 100 miles wide, between Land's End and the Island of Ushant, near Brest, retains that width towards the East for about 100 miles. From Start Point in Devonshire, the coast of England recedes northwards and from the opposite land, in Brittany, the French coast recedes southwards rather abruptly, so that the width of the Channel is increased to 150 miles. At a distance of about 50 miles more towards the East, near St. Michel in Normandy, the French coast abruptly bends round to the North, and continues in that direction for about 80 miles, terminating at Cape Le Hague, while the English land rounding gradually to the South-East terminates in Portland Bill, almost exactly opposite. The distance between France and England between these two points of land is thus narrowed to little more than 50 miles. In this wide expanse of Channel, within the deep recess or bay formed by part of the coasts of Brittany and Normandy, is found the remarkable group of Islands, known collectively as the Channel Islands. With one exception (the Chaussey Archipelago) all these Islands belong to England. Geographically, these Channel Islands belong to the Continent and to France. They must be looked upon as outlying possessions of England, and their communications with England are much more frequent and complete than with the Continent. This can be accounted for by the fact that whereas on the South Coast of England there are numerous natural harbours and important towns, there is not a harbour of the smallest importance along the whole enclosing shore of Brittany and Normandy, except St. Malo, and only two towns (St. Malo and Granville) larger than fishing stations. This part of the French Coast is approachable only by small vessels and at great risk, owing to the vast number of rocky islets and shoals, and the narrow channels and shallow water. The area of sea including the Channel Islands is a nearly regular trapezium of 3,000 square miles. In this Archipelago, Jersey with its surrounding groups of rocky islets and shoals, forms a South central group.

Jersey is an island of oblong form, about 11 miles long from E. to W., and from 5 to 7 miles wide. It is about half as long and half as wide as the Isle of Wight. It contains about 39,500 English acres, equal to 62 square miles, whereas the Isle of Wight contains 100,000 acres, equal to 149 square miles. The Isle of Wight has therefore about $2\frac{1}{2}$ times the area of Jersey. The distance of

Jersey from Weymouth is 85 miles, from the Isle of Wight 90 miles, while the nearest point of France is not more than 16 miles.

The French call the Islands " les Iles Normandes " or " Les Isles de la Manche," while the Jersey people consider their island part of the Duchy of Normandy, and speak of England as " the other side," and always look upon it as a country they conquered with the aid of William the Conqueror, Duke of Normandy.

Jersey slopes from the N. to the S., the Northern shores being lofty and precipitous. The centre of the Island is a table land, well wooded, and much cultivated, and intersected by numerous lovely valleys, each of which has its stream of clear water. The southern shore slopes easily down to the sea, and everywhere vegetation comes quite close to the edges of the bays, which are numerous and most picturesque.

Botany.

The most characteristic trees are the Ilex, or evergreen oak, and the Elm. There are no woods properly so called, but a good many small copses, especially alongside the lanes in the interior. A strong prejudice exists in the minds of the farmers against all kinds of ornamental wood, partly from fear of birds harbouring therein, and partly from a notion that the presence of trees is unfavourable to the work of the farmer, and where possible they lop and pollard the trees in the hedgerows and lanes so as to admit sunshine and air to every inch of their small plots of ground. The trees are nowhere very lofty and not so disfigured by prevalent winds as is commonly seen by the sea-side. The beech grows well and is common. There are a few coniferæ, but they are not indigenous. The lime, poplar, aspen, oak, and willow flourish in Jersey, and a characteristic form of dwarf willow, *Salix fusca*, is abundant in swampy places. None of the wood can be considered as furnishing useful timber. But everything seems to show that in former times there were large tracts of forest that have since been submerged. The timber then grown was larger than can now be found. There is in the Museum part of the trunk of a submerged tree (oak) four feet in diameter. Gorse, heather, bramble and broom are very abundant in the uncultivated parts. The gorse seems to bloom all the year round. The Butcher's broom (*Ruscus aculeatus*) is very abundant in copses and hedges. Various kinds of wild roses are found, and the sweet briar is found in Jersey only of all the Channel Islands. There are many wild flowers found in Jersey, which are rare or not found in England. Amongst these I might mention the Ixia (*Trichonema columnæ*), *Orchis laxiflora*, *Scilla autumnalis*, *Orchis Morio*, *Neottia aestivalis*, and the only flowering sea-weed, *Zostera marina*. One plant strikes one as most plentiful everywhere, and that is the navel-wort, *Cotyledon Umbilicus*, every wall and bank being covered with it. Two rare sedges are found here, *Cyperus longus* and *Cladium Mariscus*. Of grasses Jersey has 15 species not found in the other Islands. *Lagurus ovatus* is a specially pretty grass.

Two very rare grasses are *Knappia agrostidea* and *Cynosurus echinatus*. Ferns are numerous and beautiful, and include the harts-tongue, with many varieties, the maiden hair (*Adiantum Capillus H. Veneris*), *Asplenium Trichomanes*, and *marinum*; and *Gymnogramma leptophylla*. Three species of Equisetaceæ are found in Jersey, and three of Characeae.

Mosses and Lichens are abundant, and the latter especially give a striking tone and colour to the coast scenery, and greatly obscure the mineral character of the rock surfaces. The Fungi, though numerous, have not been much studied. Sea-weeds are most abundant and varied. Diatomaceæ are very abundant and interesting, especially the marine forms.

The Flora of the Channel Islands consist of 890 species, and 238, or 27½%, are peculiar to Jersey, whilst only 52 species, or 6% are absent. Many sub-tropical plants have been introduced into Jersey and flourish exceedingly.

Zoology.

Mammalia.—The wild beasts of Jersey are not numerous now as they were in past ages, when Jersey was part of France. Then the fox, the wolf, the longhorned ox, certain deer, and even the woolly rhinoceros were inhabitants of the land, as has been proved by their remains which have been found in caves and peat deposits. Now the Mammalia are represented by nine genera and 15 species. These are the hare, rabbit, brown rat, black rat, long-tailed field mouse, short-tailed field mouse, the shrew, mole, stoat, the water mole, the hedge-hog, the long-eared bat, the pipistrelle bat, the marten and the bank vole, which seems to be an animal peculiar to Jersey.

The hare is becoming very scarce, and will soon be extinct. Of marine forms (Cetacea) the only constant species is the porpoise, but the grampus is frequently seen off the coast. The common seal is occasionally captured, and one specimen of the great grey seal has been taken.

Birds.—Considering the limited area of the Channel Islands and their dense population, and the persecution all kinds of birds get from every man who can get hold of a gun, the number of birds is surprising. The list comprises about 190 species, of which about 90 are residents and about 100 are visitors.

Of birds of prey there are eight species which are residents: Kestrel, sparrow-hawk, common buzzard, merlin, peregrine falcon, and three owls, the barn owl, the short-eared owl, and the long-eared owl. The hoopoe and golden oriole used to be abundant here and nested,but are nearly or entirely extinct.

The starling, which used to be only an autumn visitor, has taken to breed in Jersey since 1890, and may be seen in enormous numbers coming in the evenings to roost in the evergreen oaks. The magpie is very abundant, almost every copse having one or more nests.

Numerous sea-birds are to be seen in the bays, and following the plough inland, but few seem to breed here, except the crested cormorant, or shag, and the herring-gull. Many species of ducks and geese visit the Island during the winter, of these the commonest is the brent goose. The stone chat is common along the shore and in the inland pastures during the winter. Of rare birds on record are the golden eagle, white-tailed eagle, osprey, spoonbill, wild swan, the avocet, the bittern, the great bustard, the bee-eater, and the Bohemian wax-wing. There seems no doubt that these islands are on a line of migration from the Continent to England and the North.

Amphibia are represented in Jersey by the Frog and Toad, the latter attaining an enormous size and being locally known as the " Jersey Cropper."

The following Reptiles are found:—The sand lizard (*Lacerta agilis*); the green lizard, abundant, beautiful and variable; and the ringed snake. As in Ireland, no venomous reptile is found. The smooth newt and palmated newt are both found in Jersey.

Fishes.—There is an extraordinary variety of fishes found in the seas surrounding the Channel Islands. Few of the Northern British species are absent, and there are a great number of representatives from the Mediterranean.

Unfortunately, their variety and beauty are in inverse ratio to their economic value. The list is formidable, but no fleets of fishing-boats are seen, only a few straggling open craft, which make a precarious living inshore. There is practically no export trade in fish, and not even enough is caught locally to supply the inhabitants. Indeed, quantities of fish are imported from Plymouth and London.

The most abundant local fish are: Conger, red and grey mullet, basse, bream, rock fish, gurnards, and dog-fish, and the sand-eel.

Of rare fish, the following have been taken: The Torpedo-ray, the angel fish, the sturgeon, the sun fish, the angler, and the gorgeous *Sciæna aquila*, a fish clad in gilded and coloured scales, the size of half-crowns. The Lancelet (*Amphioxus lanceolatus*), the lowest of vertebrate animals, is by no means rare.

The fresh water fishes consist only of the eel, stickle-back, and loach, the streams being too small and easily dried up in a hot summer for larger fish to live. In certain ponds carp, tench, and trout have been introduced.

Considering the size of the Island, there is quite a wealth of Insect life. Lepidoptera include about 600 species, among which are such varieties as the Queen of Spain Fritillary, the Glanville Fritillary, the Comma, the Bath White, and the Long-tailed blue. Among moths, the fine Death's Head and Convolvulus Hawk moths are fairly common, and the well-known *Callimorpha Hera*, or Jersey Tiger, is abundant.

As many as 550 species of Beetles are known, among them especially the brilliant *Calosoma sycophanta*, and several species new to science are recorded from Jersey. The Orthoptera (grasshoppers, earwigs, etc.), the Neuroptera (Dragon-flies, etc.), and Hemiptera (Bugs) are well represented. In the last named order a characteristic species is the pretty little scarlet and black *Pyrrochoris aptera*, the markings on which are in grotesque caricature of the human face.

The Hymenoptera (Bees and Wasps) are abundant, some 60 species being known, and bee-farming is quite an industry. The hornet is not known in Jersey.

Very little has been done among the Spiders and Oribatidæ (Mites), although they are known to be very numerous.

The Myriapoda (Centipedes and Millipedes) are represented by about 10 species, two of which are natives of Southern Europe and may have been imported accidentally.

Mollusca are not so plentiful in Jersey as in some of the other islands, probably owing to the rocky nature of the coast. Still, by diligent search, a number of species may be found.

Land Molluscs are very few in number and, curiously enough, the French snail, *Helix Pomatia*, is absent. Of Marine Molluscs, several interesting kinds are found, including especially the Ormer (*Haliotis tuberculata*), the Chitons, *Ianthina Rotundata*, etc. Nudibranchs (naked or shell-less Molluscs) are very common and beautiful. Cephalopods (cuttle-fish and octopus) are fairly abundant, especially on the East Coast. Brachiopods are represented by one very small species only, *Argiope Capsula*.

Crustacea are very numerous, among them being the Crawfish, which grows to a great size. Prawns and shrimps are abundant. There are many varieties of Crabs, among which may be mentioned the beautiful Lady Crab (*Portunus Puber*), the large spider-crab (*Maia Squinado*), the square nosed lobster (so called), *Scyllarus Arctus*, a Mediterranean species (*Stenorhynchus ægyptius*), which decks itself with gaudy seaweed, and many others.

The Amphipoda (sandhoppers, etc.) and Isopoda (woodlice, etc.) are very numerous and interesting. Echinodermata (starfish and sea urchins, etc.), and Annelida (worms) are well represented, and many of the former grow to a great size, the two starfish, *Asterias Rubens* and *glacialis*, sometimes being found measuring 16 and 20 inches. Many rare and curious forms are found. Zoophytes, Anemones, jelly-fish, are most abundant and beautiful. Many rare and interesting Foraminifera occur in the waters all round the Island. Of these a complete list was published in the Proceedings of the Manchester Microscopical Society for the years 1888 and 1891.

Geology.

There is good evidence that Jersey was in former times a portion of the Coast of Normandy, but, owing to alternate

land elevations and subsidences, it has been connected with and separated from Normandy on, at least, three occasions. But its first separation—probably in late tertiary times—was through erosion of softer rocks, by which, until then, it had been covered. That it was once continuous with the plains of Normandy, and at much the same elevation, is shown by the yellow clays which cover even the highest land, and bear clear evidence of a diluvial origin, and, of course, could not have been derived from such a limited insular area.

The Rivers Seine and Somme (combined with tributaries from the South and North) running to the Atlantic, formed the mouth of the English Channel. Hurd's Deep, to the N.W. of Guernsey, probably marks this old river channel. It will be readily understood that Jersey and its neighbours must be made of some very resistant substance to withstand the prolonged erosion of the sea. And so, indeed, they are. For the north-western, south-western, and south-eastern coasts consist of fairly coarse Syenitic granite. Its eastern half consist of volcanic rocks, chiefly Felsite, while the north-eastern cliffs and islets are formed of a peculiar volcanic conglomerate, or agglomerate. Between the granite areas of the north-west and south-west, and extending to about the centre of the island is a large area of stratified Archæan shale, a dark slaty-looking rock, which, from its regular lines of bedding and the presence of ripple marks on some of the exposures, has evidently been deposited in fairly shallow water. It must be very ancient, as no trace of fossil organisation, macroscopic or microscopic, has yet been discovered in it. Fragments of this rock are very frequently found embedded in the granites which have intruded upon them. The volcanic conglomerate already mentioned, contains also about 80 per cent. of fragments of this shale. From what pre-existing land this deposit can have been derived it is impossible to conjecture, for these beds are a mile in thickness. But it is thought they may represent the delta of some inconceivably ancient river. The granites of the Island are largely quarried for paving, and for ornamenting public buildings. One valuable deposit in the north of the Island is called Aplite, or China Stone, and is largely quarried for export to the British Potteries. It is curious to notice in many places the complex mixtures of granites of different degrees of coarseness, and the intrusion of other rocks, such as diorite, and trap and quartz in veins. In some places the Felsite rocks have a columnar structure, similar to the basalt columns at Arthur's Seat, near Edinburgh, and at Staffa.

The superficial layers of the Island consist chiefly of yellow, sandy clay, or brick earth. The deeper part of this is due to the decomposition of the underlying rocks, but the surface layer shews evidence of stratification and intercalated layers of stone fragments and pebbles, suggesting a diluvial origin.

One interesting recent deposit is an immense stretch of blown

sand, which has overwhelmed the greater part of the west of the Island up to a height of 250ft. It is called the Quennevais.

By alternating intervals of land subsidence and elevation, Jersey has been rendered alternately insular and Continental several times during the recent, or quaternary period, and the softer strata which originally covered the island have been removed. But traces of these are constantly found to prove their former existence. For instance, flint pebbles are found in all the bays, showing that chalk was over Jersey, and recently small deposits of Devonian shale, containing many characteristic fossils have been found in clefts of the granite. This shale is exactly the same as that now found forming the cliffs on the opposite coast of Normandy. Sandstone and Limestone pebbles are also found. Jersey is not a place for the fossil-hunter, but is most interesting to those who study volcanic rocks.

The proof of the subsidence of the shores of Jersey subsequent to its insulation is the presence of well-marked raised beaches. These occur at two elevations, an upper about 125ft., and a lower about 70ft. above present sea level. A proof that Jersey was elevated and Continental, or peninsular lies in the fact that the remains of the wild horse, the Urus, the reindeer and other deer, and even the Woolly Rhinoceros, together with the implements of palæolithic man have been found in caves 60ft. above the sea. In these caves no molluscan shells were found, which probably would have been the case if the sea had been within easy reach.

In historical times, during the last 1,000 years, numerous earthquakes have taken place in Northern France and in the Channel Islands. For instance, in March, 709 A.D., a serious earthquake, causing great destruction, occurred in the Channel Islands; and another, or rather a series of earth movements, took place between 22nd and 29th October, 842. On this latter occasion throughout the North of France a loud subterranean noise, recurring several times a day for seven days, was heard. Again, in the year 1091, serious and disastrous shocks were felt in the Islands and in the North-west of France. Two years before that there had been severe shocks in England, and again in 1161. The whole shore of Brittany, and Normandy, and the Islands were greatly affected by earthquakes. At the end of the 17th Century a severe earthquake shock occurred in the sea, off Sark. The year 1691 was remarkable for severe earthquake action in the Atlantic. On 22nd December, 1843, an earthquake was felt at Guernsey; and another on April 1st, 1853.

It is evident, then, that the region occupied by the Channel Islands always has been and still may be considered to be in an unstable state, and that there are causes close at hand capable of producing elevation or depression, slow or sudden, from time to time beneath these Islands. A well-marked proof of recent subsidence of part of the coast of Jersey is the presence of submerged

peat and forest beds in most of the bays. Normally, the surface of the Bay of St. Ouen's is covered thickly with sand, but in September, 1902, owing to some peculiar circumstances of wind, and tide, and currents, a vast quantity of sand was suddenly removed, and this submerged forest was laid bare. Luckily, the Curator of the Jersey Museum, Mr. Sinel, was near by at the time, and obtained an unique and most important photograph.

Again, there is a record of a Manorial Mansion which stood on the northern side of St. Ouen's Bay, now the remains of that mansion are covered at high tide by seven to eight feet of water. There are also the remains of a Chapel on the Ecrehou reefs to N.E. of Jersey. This Chapel was built in the 12th Century, when these reefs were continuous with the French Coast, now the ruin of the Chapel is covered by several feet of water at high tide.

It has been calculated from various observations that land subsidence has occurred for the last few thousand years at the rate of about 17½ inches per century. Therefore, with an average of 30ft. of water at low tide between Jersey and France, the Island must have been accessible from the Continent about 2,000 years ago at low tide, and, assuming the same rate of subsidence for the preceding milleniums, Jersey would have been fully Continental some 4,000 years ago. The larger bays of St. Ouen's and St. Aubin's have been carved out of the less resistant Archæan shale, while their horns are formed of the more resistant granites.

The sea has carved out a great number of caves in the softer portions of the granite rocks—about 60 occur on the north coast, and about eight on the south-western corner.

Sub-aerial denudation also plays an important part in giving the Island its rugged appearance, as can be seen by the coast near La Moye, where the cliffs are weathered into fantastic forms, while the shore is strewn with blocks which have fallen from these cliffs.

Very few minerals are found in Jersey, in fact, none exist in payable quantity. Amongst the ores that have been found are Galena, with silver, copper as erubescite, and Sulphate of Baryta; whilst traces of gold, platinum, zircon, molybdenite, and iron have been found by analysis.

On Order and Method in forming Collections, with especial reference to Insecta and Aves.

By W. Parkinson Curtis, F.E.S.

Read before the Zoological Section, April 25th, 1912.
(Revised and with additional notes.)

THE methods I shall suggest are not perfect, but they are the result of over 20 years' experience of collecting myself and comparison with other Collectors' methods. These methods I adopted because they appear to present the maximum of ease of reference and of certainty, with the minimum expenditure of time in looking for notes; and the greatest possible and most numerous results for the least amount of clerical labour. My brother and I carry out these methods in practice. We find them not unduly burdensome, and are beginning to get a mass of information together of the highest utility. We also have the satisfaction of knowing that when we leave this world of toil our successors and assigns will have, for what they are worth, the records made at the time as a result of our work and such part thereof as may be of value will not be carried with us to the grave, but will be available to add to the common sum of knowledge of mankind.

Too many people in every sphere of life are too fond of acting in the spirit of the selfish and bad question, "Why should we take care of posterity, what has posterity done for us?" Real progress in science can only be made if each and every worker will work with the remembrance of the fact before his eyes that in scientific research the longest life is all too short to be certain of attaining definite result. The progress of the next generation in science will be small or great according to the mass of information that is at their disposal, and which must, to a very large extent, have been compiled by the generation preceding them. See, therefore, that any knowledge you acquire, any facts you discover are committed to writing, and rendered available for future reference. I maintain that you have no right to destroy life in the formation of collections and then take with you to the grave the whole of the information you acquired, and so compel future generations to destroy more life to get at the same results you arrived at and ought to have recorded.

If you fail to record you are a useless encumbrance, regarded scientifically, and you do not merit the name of a scientist. You might as well collect postage stamps or old china as natural history objects. Your collections without data and arrangement will be mere collections of mummified remains which might as well grace a dustheap for all the good they are.

He who will not take the trouble to record because he is too lazy, he who won't take scientific pursuits seriously and work for a definite result, is a person of no scientific merit and utility, and such a person I don't address my remarks to at all. It is a lamentable fact, however, that some of the most efficient and successful field workers are those who do least with the pen, and I know at least two people who are most successful collectors who will not write. Fortunately some of their results I have been able to take down in writing direct from them and so preserve, but the rest of the results might as well never have been attained. Don't allow the sporting side of the collecting to crowd out the pen and ink work indoors.

You ought also to make up your mind what you intend to study and specialize as much as possible, never, however, losing touch with general problems, otherwise you will run a grave danger of becoming pedantic and impractical, and of working your way into blind alleys through some faulty method due to want of breadth of view.

As to obtaining specimens. First of all *Insecta.*

My actual working experience extends to " Lepidoptera " only, but my methods are largely applicable to any branch.

(1) Sugaring, that is putting on trees, palings, thistles and tufts of grass, and large plants a compound of boiled treacle or coarse sugar, beer and rum, with fruit essence, such as jargonelle added. Every book gives full directions. It is a popular, but uncertain, method, and as its results vary from nothing to having 80 or 90 moths on a patch it is best worked in conjunction with some other method.

(2) Flighting consists of catching things at their natural time of flight.

(3) Flowers: Ragwort, thistles, valerian, bramble blossom, clover, sainfoin, the large umbelliferous plants, heather and heath, the campions, rhododendrons, verbenas, jasmine, aloysius, scabious, bugle, lime blossom, sallow blossom, knapweed, cistus, nicotiana, geranium, and other sweet smelling flowers are attractive, especially on downs or near the sea coast. These are things which are too often neglected in favour of the more orthodox method of sugaring. Many insects come to such plants which will not come to artificial sweets, notably the sphinges, the Noctuæ of the genus Heliotis and Cucullia and sub family Plusianæ.

(4) Searching in the morning early on palings, posts, trees and walls occasionally pays, but should be pursued before the sun is up. In the evening and afternoon one may often find new emergences drying their wings in such situations.

(5) Beating vigorously with a stick or stamping upon rabbit burrows and overhanging banks often results in some insect rushing out in a hurry into the ever-ready net.

(6) Light traps. If you have a suitable place a light trap on the American moth trap principle will often pay most amazingly, but it is not much good in a town where there is a lot of artificial light about. Such traps are not difficult to make, but are somewhat dear to buy, and my friends who work them tell me that they find a well diffused light of fair power better than an intensely bright light of small dimensions, which will perhaps be better understood under the next heading.

(7) Light work. My brother and I have been working light on the following principle, obtaining many insects of undoubted interest by it.

First, we use a large sheet suspended by the corners, to which are strongly sewn stout brass rings. Have plenty of strong blind cord, throw the cord by a small lead weight of about 2lb. over the bough of a tree, detach your weight, and leave the cord hanging, next throw another cord over the bough about twice the width of your sheet down the bough. Make fast one line to each upper corner of the sheet and pass the free end through the rings, next drive into the ground two longish stakes with holes in the end at such an angle that they will withstand the strain on the sheet, pass the lines through the bottom rings, then through the eyes in the stakes, and finally through the bottom rings, haul taut and make fast to the bottom rings. Your sheet will now be tightly stretched, like a lantern sheet. The sheet should be white or nearly so. A loose flap at the bottom touching the ground is an advantage. Stretch at right angles to a ride or path, and moderately high up.

To Illuminate your sheet. We use a 10-inch Rushmore Searchlight (costing about £8 to £9), because we happen to have one. I have procured quite good results with bicycle lamp on the same principle, i.e., the Mangin lens mirror, costing only 24/- Acetylene gas is convenient and clean. Use a separate generator, coupled to a horsehair scrubber, this gives a supply of fairly clean acetylene gas. There is room for experiment as to that part of the spectrum which is most attractive to insects. As will be known to most of you, acetylene is very rich in the violet end of the specrum.

The moths come to the illuminated sheet at all hours of the night, but best from 11.30 to 1. As a rule they come in little parties of several different species together, followed by a lull. We simply sit on a camp stool and wait, one each side of the sheet, and net them as they come in. (See Note A).

Note A.—Since I addressed the Society I have been working in the Fens in conjunction with a professional collector. He averred that I did not want much teaching about setting a lamp and sheet, but as his methods and mine were rather different, and I thought in some respects better, I will give them. Like me he set his sheet across the wind and kept his lamp on the lee side. Unlike me, he used a lamp open at three sides, and with only the dark side away from the sheet. He also did not use a scrubber. Now several species came freely to his light which did not come to mine, and *vice versa*. I believe that to be due to the fact that his light was more diffused, and being open at the side, some insects were first attracted by the flame and then got into the area of the sheet light. Some seemed to prefer the lamp to the

(8) Beating disturbs many imagines from their hiding places.

(9) Breeding. This is a good way of getting fine specimens, and will enable you to study the early life history of an insect. In all branches of the Insecta our knowledge of early stages is very imperfect, but insects selected for special study must be segregated, and great care taken not to mix them with other insects, or confusion will assuredly arise.

This is especially so with regard to introducing food plant into the breeding cages, unless great care be taken small larvæ of other species are introduced and give rise to incorrect and unsatisfactory results.*

Breeding ex ova likewise pays well, and many species lay quite readily, others require special inducements to lay and prolonged feeding.

As an example of the kind of work that may be done with breeding from the egg in quantities I instance Professor Poulton's experiments, recorded at Trans Ent. Soc., London, 1892 and 1898.

For obtaining the larvæ themselves, searching the food plant, beating with a Bignell tray and sweeping are the usual methods. Searching is the only way with many larvæ, and teaches more of their habits than any other method, it is trying to the patience and requires considerable perseverance, but on occasions is well rewarded.

Beating. The Bignell beating tray is the best apparatus. It is 10/6 to buy. I prefer making my own, as they cost me 2/3 to make and are vastly superior when home made. The bigger the tray the better, but a big tray requires a strong wrist, so don't overgun yourself or beating becomes a painful exercise. The longer the stick the more larvæ you will secure, as the moths lay their eggs at different altitudes, depending greatly on the state of the weather at the time of ova depositing. Again, don't overgun yourself with a stick or you will find you cannot give the branches that smart, sudden jar which causes the larvæ to drop off the boughs into the waiting tray.

Sweeping with the sweeping net. A big handle, a strong iron ring and a stout calico net, plenty of elbow grease and perseverance are the necessary fit out. It is most excellent exercise, and warranted to reduce the most persistent deposit of adipose tissue.

The free end of the bag is best attached to the handle by a

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sheet. On the other hand lack of a scrubber meant taking down tubing to clear it of moisture, whilst I could go all night without any trouble. He set his sheet on three stout poles, one in a rebate of stout calico each side of the sheet, then stuck the poles in the ground and stretched them with a single cord to the ground tennis net fashion. No 3, planted in the centre of the sheet, was strained away from the lamp, the sheet being carried to ground level. The arrangement is good but not portable, and as portability is important to me I use jointed bamboo poles and set my sheet by strained cords as if I were setting a flat sail, relying on my cords for stiffness and not upon my poles, the latter being very light. I think the sheet ought to touch the ground.

* Breeding from wild larvæ often results in the emergence of parasitic flies of the orders Hymenoptera and Diptera. Such parasites, when you can trace the actual host with certainty, are of great interest, but it is a *sine qua non* that the host should be certain.

length of string, this prevents it reversing and emptying when the ring hits a stump, It also prevents the bag swinging wide and causing the larvæ in front of you to drop.

In using a sweeping net the net should be pushed through the herbage from side to side in ziz-zag fashion ahead of you, holding the net slanted much as a shrimp net is held, so that the larvæ shaken may fall into the mouth of the net. Night time pays best.

The following books are well worth getting and contain fuller details and most useful hints:—

Newman, L. W. Book issued April, 1913.
Knaggs. Guide.
Green. Insect Hunter's Companion.
Tutt. Practical Hints for the Field Lepidopterist.

As to methods with other insects, they are remarkably similar, but I do not feel sufficiently versed in the methods of collecting the other orders to give any direction.

When netting use glass-bottomed pill boxes to carry home your captives in and kill them at home, do not kill them in the field if it can be avoided. Most species travel well in boxes, especially if kept in the dark. The large Sphinges and the noisy Lasiocampids must usually be killed by a capacious cyanide bottle at time of capture. If it is contemplated that the second flight be worked, kill your captives before the second flight comes, otherwise they will knock about.

We kill with chloroform by taking each box and, from the *inside* of the cover, making a small hole; with a pipette drop a little chloroform on the hole, when the insect speedily becomes unconscious and can then be dropped into the Cyanide bottle. I prefer Scheele's Prussic Acid to anything myself, but it is difficult to procure and very dangerous in inexperienced hands. With pipette, chloroform and killing bottle we can on return from the chase finish off 200 insects in ten minutes or so. They should be left in the killing bottle at least two hours and then transferred to a Newman's relaxing tin (supplied by L. W. Newman, of Bexley). I have now had one of these tins in use for twelve months, and have passed over 4,000 insects through it, and it is the best relaxing tin I have ever struck. It keeps insects beautifully limp without either mouldiness or staining.

With regard to nets, I prefer a ring net to any other form, since I am more certain with it, but kite nets are also useful.

Umbrella nets I don't consider pleasant to use, but they are useful if you want to appear not to be collecting. The handle should be as short as the work in hand permits. My usual handle is about 1 foot 6 inches long, but I use one 11 feet or so when catching *B. parthenias*. For successful use a long handle must be well balanced, actual weight matters little within reasonable limits if the balance is right.

PRESERVATION.

I don't propose to give you a disquisition on setting boards. I will merely say you will require an assortment, and more from 2 to 1½ inches wide than any other size. I find that about 180 represents my stock, and they all get a turn.

The English fashion is to use rounded boards, it is a purely insular practice with nothing to recommend it. The Continental method is to use very high flat boards and immensely long pins. The method in small insects looks unsightly, I prefer a moderately long pin and flat boards. The pin should be high enough to keep the insect well off the paper, and should be proportioned to the size of the insect. In pinning, avoid disarranging the thoracic crests, especially in Noctuæ, as they are valuable for classification purposes.

Flat boards produce an insect with its wings more or less in a horizontal plane, and this permits of easy examination under a lense or microscope. The roundset insects are very difficult to study in this manner.

There are procurable now pins made of solid silver, they are somewhat dear, but an active collector will not use £2 worth a year and, since they do not verdigris, they are invaluable for all insects tending to grease.

When resetting do not, as recommended by the books, glue the angles of the wings to prevent springing. If the wings do spring it is impossible to reset a glued insect again without ruining it. Moreover, it tends to destroy the legs, the frenulum, and the jugum, and retinaculum, all of which are of great importance. I have tried this method, and it is sinful.

Another recommended nostrum, which is, likewise, an abomination, is dipping the entire insect in alcohol and mercuric bichloride to preserve it against mites. It does preserve it, but the value of the insect as a specimen is destroyed, since all ciliæ and hairs are spoiled, likewise the metallic colouring. Petrol is the best thing to use if one wishes either to ensure that imported insects have not got mites in them, or desires to remove grease.

Setting. For very large insects I prefer transparent tracing cloth in long strips, start at the top of the board and set down.

For medium size insects strong tracing paper in long strips, starting in the centre of the board and working to each end.

For very small insects, bristle braces, and card triangles, secured to pins by asphalt cement used for microscopic purposes. Small insects should be stupified with chloroform only, set, and then killed by touching the abdomen and head with a small sable brush charged with chloroform. This prevents them coming round and does less injury to their plumage than setting them when quite dead. They must be thoroughly under the chloroform so that they do not react when pinned and touched. In fact, treat them as a patient undergoing a surgical operation, but don't let them come round.

For bristle braces there is nothing equal in spring and smoothness to the whiskers of an old tom cat, who can be deprived of a sufficient number of whiskers to make an excellent set of bristle braces without pain or inconvenience to the cat.

Every drawer in the cabinet should contain plenty of napthaline and a small tube of glacial carbolic acid. Store boxes should also have napthaline secured in muslin bags and tufts of wadding on pins dipped in carbolic acid. This prevents mould and is not beloved of mites. Periodic renewal as occasion requires is imperative.

Camphor is not, from my experience, much use, and tends to produce grease.

Insects should be kept in a dry place in the dark, and in an even temperature. A Kerm gas stove with a chimney is, I find, a most efficient stove for heating any museum room and keeping it dry.

RECORDING.

Let us assume I have returned from a day's collecting in the New Forest, and the following is my procedure: I first attend to my animal comforts, for an equable frame of mind is the best one in which to set to work.

Then I turn all my captures in the pill boxes up on the table. I sort out all those requiring the surgical operation mode, above described, and put them on one side. The remainder are looked at for chipped specimens which, unless badly required species, are liberated. I then get out my diary, and pen and ink.

My diary is ruled. Column one, the date. The rest of the page is for matter. Column two, generic names. Column three, specific names. Column four, is for a variety of little hieroglyphics, the utility of which I will describe later. I then write in my diary my itinerary, state of the weather, direction and strength of the wind, anything worth noting in the way of attacks by birds on insects or insects on insects, habits noticed, flowers preferred, mode of flight, courting, and the like. The relative abundance or scarcity of insects seen, and similar information. Next follows the list of the day's captures, so far as I know the name, and a space for undetermined captures. The residue left after the second examination are then turned glass down. The pipette is charged with chloroform and, as I drop a drop of chloroform on to the hole in the lid of the box with my right hand I turn it over with my left. A few minutes see all the boxes done, and by the time the last is finished the first patient is ready for the cyanide bottle.

I now proceed to operate on the small stuff, as above described, and this is important. As I finish with each setting board I put a minus sign in the fourth column of my diary for every insect set, against the known species names, and against the blanks for the unknowns. I then write my data tickets for that board and, when ticketted, I put a tick against the minus sign. About data tickets

I will explain later, but I want you to observe that by this method I secure several things. First, I know how many insects of a day's capture are set, my minus signs tell me that, I know whether I have written their tickets, my ticks show me that, and lastly, whilst the whole thing is fresh in my mind, I have placed against each insect and pinned on the setting board the actual data of the insect, thereby minimising the risk of making mistakes in the data. So if I have to leave my setting in the middle, instead of hunting about to know what there is to be done and what was left undone, my diary shows me at a glance.

The next morning I empty my cyanide bottle into the relaxing tin. By the time I return in the evening the rigor mortis has left the large insects and they are fit to set. Setting and ticketing is proceeded with in the same manner as for the small insects until all are done.

When removing from the boards I turn my minus sign to a plus sign, which signifies that the insect is off the board and awaits determination.

My diary shows, therefore, quite a lot of information as to where my insects are, what more is required to prepare them for the cabinet.

Comparatively, it shows also the possibilities of a locality, the state of the season and, by comparing the entries with complementary dates, inferences of considerable value may be drawn. I have diaries on this principle extending for 17 years, and for the last five years my brother has made all his entomological notes in my diary, so there are gathered together the observations of two collectors over quite a long period of time.

DATA TICKETING.

Datum (pl. *Data*) and date are words which should not be confused. Specimens without data are almost wholly valueless from a scientific point of view, and data tickets can hardly be too detailed. They should be on a paper which will last well and written in ink which is waterproof and will not fade or discolour. It is essential that they contain at least the most precise locality of capture that can be got. The actual date of capture, the name of captor and where bred, the food plant, especially with the micro-lepidoptera, is an invaluable piece of information. I use the following form, say:

*
Ramnor,
New Forest,
England,
6—vii.—1907.
W. P. Curtis.

The asterisk denotes that the insect is bred, if bred from the egg add ex ova. It is necessary to add the country as well as the place, since Colonists have duplicated locality names of the Mother

Country all over the world. Corfe Castle, Dorset, may be our familiar ruin over the border, or it may be in Tasmania, therefore, add your country. The name of the captor is best put sidewise, it cannot then be mistaken for any part of the locality name. When collecting in mountainous districts approximate elevation, as shown by aneroid or hypsometer, should be added.

There is a tendency amongst foreign collectors to send insects home very insufficiently localized; partly this is carelessness, which is very reprehensible; partly lack of geographical knowledge, which is remediable; partly absence of proper surveying, which time alone will cure, as civilization advances into the comparatively unknown areas. E.G.—I have had a series of *Eurota histrio* sent me labelled Matto-Grossas, Brazil. Well, you could probably dump the entire British Isles into Matto-Grossas, so great is its area. The locality is better than none, but it would be a big order to find the insect again if a local species in that area. The date. You will observe that first comes the day in Arabic figures, second the month in Roman figures, lastly the year in Arabic. The Americans are very careless about this. Now, this is the proper order for the figures to come in, moreover, the month is in Roman figures, and, therefore, you are not in doubt whether that date is the 6th of the 7th month, or the 6th month and 7th day, which makes a great deal of difference. Lastly, you will see that there are four figures to identify the year. I protest most emphatically against the slipshod practice of using the last two figures only to designate the year. We are now in the year "1912," not "12." You must recollect that specimens exist in collections caught as long ago as the latter end of the 17th Century, and many exist caught during the 18th Century, and therefore risk of confusion is considerable if the entire figuring for the year is not recorded.

Some collectors have chosen to poke great fun at my data tickets because of their precision, but lack of precision ought to be an abomination to every scientific worker.

The data tickets should be printed in diamond brilliant, a font of which can be procured for 13/2. It is the smallest available type. Writing data is tiresome and trying to the eyes. If you write data you must write them very distinctly.

W. F. Kirby, and other writers of popular books, recommend a number only upon the ground that large tickets with full details spoil the appearance of a collection. Well, a collection is not got together for the sake of prettiness. So the objection is futile. I have had a number of insects sent me with numbers only, entailing tedious correspondence to get accurate data. Once and for all, put all your information on the ticket and put the ticket on the insect's setting-pin, and then the insect, always barring rare accident, takes its credentials with it to the great comfort of your correspondents and to the lasting benefit of science.

CATALOGUING.

When my insects are off the boards upon which I leave them about six weeks, which is not too long, I proceed to catalogue them as follows:—Each insect is given a serial number, and the data checked against the diary is entered in the catalogue and catalogue number placed in the diary. Where an insect is known its determination label bears the number, where unknown the number is placed in the reverse side of the data ticket.

Now I will just deal with the determination labels and then with the utility of the catalogue. The determination label bears the number, genus, species, author and name of person responsible for determining the identity, and the date of the identification.

The utility of this is as follows:—

The number enables one to refer to the history at once without taking up the insect.

The genus and species, with author, enables one to see at a glance which particular species the insect is referable to.

The name of the determining person enables one to see what degree of weight ought to be attached to an identification which does not entirely agree with one's own ideas.

The date of determination is useful, since it gives a partial key to the subsequent owner of the available synonymic literature the determining person had access to and might, in doubtful cases, elucidate what the determining person really intended.

The determination label is cut so that it projects beyond the head of the insect, and the pin is run through the blank end. Incidentally, the label helps preserve the forelegs and antennæ from danger.

The data ticket is turned face down and the pin run through, which enables one to read it by turning the insect up without taking it off the pin, which one would have to do if placed below the determination label and face up.

You may ask, why face down? Well, the curious who view our collections are not always people to whom we desire to disclose the exact locality of scarce insects, therefore, face down is my rule.

Those insects without determination labels have their several numbers to refer to them by, and when working them out one only has to keep all one's notes on a loose sheet under the serial number and thus minimize one's notes being presumed to refer to another insect. The same applies to preparations of such an insect, it is known by its serial number till we can put a name to it.

You may ask: What is the good of the Catalogue? First, it enables you to gain ready access to your data without opening the cabinet drawers.

Second, it is an index to your diary, since insect No. 1,000 in the catalogue was caught 9th Sept., 1901—you can find out all your notes in the diary relating to it at once.

Third.—You are asked what is the distribution of a bug in your locality, look at your series, turn up the numbers, and you have it at once, with such further information as to geological formation and habitat as the diary affords.

Fourth.—It enables you, in the last column, to note what has happened to the insect, if it is compared with the type or a co-type, or a paratype. You will see my catalogue is arranged No., date, name, locality, remarks—five columns, and a volume this size roughly answers for 4,200 insects.

SYNONYMY.

Besides my diary for current events and my catalogue of data, I have a loose-leaf recording book. In this book I keep all the information I can get hold of about any insect arranged under that insect and the families and genera are arranged serially. It is, in the first place, a synonymic catalogue, in the second a repository for extracts from books and magazines and for copies of figures, localities, food plants and the like, and brings the scattered fragments of information relating to an insect into relation with each other. It also enables one to keep a steady record of such new descriptions as may have come out. A writes a big catalogue in 1901, in which he gives current reference to all described insects of a family to that date. The immediate result is that knowledge to that point having been focussed, workers start at once and afresh from that point with more new descriptions and observations, as you come across them down they go, or a reference to them goes in your loose-leaf record, and when your turn comes to work at the family or genus, you can feel fairly comfortable that you are not describing as new something done a year or two back, which you have lost reference to or forgotten.

Besides, a good library is very expensive, and it is often exceedingly useful to have copies of well-known or critical figures at hand, and very useful to have good drawings of types at your command. I only wish the loose-leaf system had been invented when I started collecting years ago.

ARRANGING.

When arranging your insects make up your mind what you intend to show. If distribution, arrange the insects geographically with a label showing the place of each, say the country or county. If variation, start with the typical form, and grade your insects to show the intermediate to the extreme varieties and aberrations; labelling the *forma typica*, the intermediate *transitus ad* —? , the abberrations or varieties their regular name, don't put the extremes together to contrast them, it may be startling, it is not instructive. If both, have a separate drawer or series, but you must in that case have a very long series.

Where possible add the early stages preserved. It adds vastly to the interest and value. With mimics, where possible, show the supposed model with which it is associated.

Put the labels of your families, sub-families and genera at the head of the row, the specific names at the bottom, keep one label to the first series for the synonyms, the other series of that species need only be labelled with the name having priority.

Small explanatory labels showing the points on which sections of genera are formed are of great utility to others utilizing the collection, and help one to keep the value of the sections in mind.

At the bottom of the row it is an excellent plan to give the numbers of any microscopic preparations you may have made written on a card and pinned in. It enables you to get out the slides referring to that insect readily to illustrate a discussion or elucidate a point, or for any of your own purposes.

Do not follow every whim of classification, adopt a good general scheme, e.g., Sir G. F. Hampson's, and stick to it for a long period, noting in your loose-leaf records reasons for doubting its entire correctness and other people's views.

Microscopic Preparations.

A separate catalogue in the same order as the Synonymic list is useful to have by you, each slide being given a serial number.

For general utility in mounting preparations of insects Canada balsam seems to me best. Gum Styrax is not bad, but is useless in deep cells; for larvæ and ova Farrant's medium is very good. As to stains. I have been fairly successful with acid carminic and gentian violet, less so with methylene blue. (See Note B).

I label both ends of my slide, one end serial number of slide, the name of insect, catalogue number of insect and date. The other end mounting medium, stain used, date of finishing preparation and, lastly, special points of interest.

There is much room for research as to the best mode of preserving the delicate tests of lepidopterous ova, since I have not seen a satisfactory preparation yet. The tests slowly disintregrate in all the media so far tried. I have not tried parolein.

The embryonic stages of lepidopterous larvæ are insufficiently studied, and open a field for an energetic worker where much good work may be done.

Note B.—Since the above was read I have had an opportunity of discussing preparations of wings to show neuration with J. Hartley Durrant, Esq., a gentleman of great experience, one of the foremost of microlepidopterists. He tells me that after many years unstained preparations of the wings of lepidoptera became invisible in Canada balsam owing to the penetration of the balsam into the fabric. He recommends the following method: Soak your wing in absolute alcohol, and whilst it is still in the alcohol brush the scales off gently with a sable brush. Take the wings, put them on your slide, put on your cover glass, fill with absolute alcohol, bind the cover glass down with strong gummed paper, the centre of which has been cut out to a circle smaller than the cover glass to show the wing through. The alcohol will evaporate leaving the wing easily visible. Slides so prepared keep well, and the other pair of unstripped wings can be mounted at the other end of the slide as a check to identity of the mount. If necessary the legs, palpi, etc., can be treated in the same way. Mr. Durrant showed me numbers of his preparations, and whilst they are not as pretty as Balsam mounts their utility is certainly greater and they show no deterioration after years of use.

Do not be misled into thinking that low power work is all that is necessary. For much useful work objectives from 4in. to ½in. suffice, but many times I feel the need of objectives of higher power than ¼in. A good substage condenser is a desideratum, and a Baker Nernst electric lamp furnishes a good source of light, since the light is powerful enough to penetrate comparatively dense structures which it is not always easy to render transparent without causing damage to other more delicate structures in their vicinity. In fact, the lepidopterist can do with as good and full a stand as he can afford.

The like applies to his microphotographic apparatus. The better it is the better his works, but here I may say at once that usually his longer focus lenses will be the more useful, relying on his extension for his size.

Photographs may usefully be recorded in the same books as your microscopic slides, giving lantern slide number and negative number. Houghton's "Negasys" file to keep the negatives in is the best.

Dissections.

A serious worker must make a number of these of every insect. The series he makes may be as extensive as he can find time and material to make. Variability is present in structure as well as colour and often serves to bring out atavistic characters, throwing light on the phylogeny of the species. The dangers of drawing conclusions from single preparations can hardly be too strongly emphasized.

For beginners nothing is more helpful than to take such a book as Comstock's Manual or Folsom and work quietly through the diagrams with such material as may be at command. Folsom contains a very valuable Bibliography which, as the worker advances, will open up to him a wealth of literature bearing on the problems he is studying.

Lastly, I would recommend every worker at Entomology to join the Entomological Society of London, which has a remarkably fine library available to members, and whose transactions are of world-wide authority.

AVES.

I must deal with these in less detail.

Procuring specimens consists, I am sorry to say, of killing them, but my recommendations are a series of "don'ts."

Don't kill a bird unless you want it. As a rule there is no necessity at all to kill, as the ornithologist is overwhelmed with excellent works with beautiful plates of nearly every British bird. In fact, it is an *embarras de richesses*. Don't kill a bird unless you are sure you can either preserve it or get it preserved before it goes wrong.

Don't kill a rare local bird of which you could procure a Continental specimen, or specimen from its habitat where it is abundant. Don't, if you intend to study birds, have them set up in cases. Such things are best left to museums. For the worker a series of skins is better and more useful.

Of eggs, don't rob rare local species for the sake of getting British specimens of eggs. A Continental clutch of *Falco peregrinus* will answer your purpose as well as a clutch taken in Britain, where this noble bird is struggling hard to maintain a footing against the senseless criminal persecution of the game-keeper and the collector.

Don't bribe other persons to procure eggs and birds you ought to help protect, the receiver is worse than the thief. It is no good comforting yourself by saying: Well, the eggs are taken now, I might as well have them. The thief will speedily drop his thieving if his proceeds of theft find no market. No man will risk his neck for rare birds' eggs after he gets a clutch or two left on his hands unsaleable.

Don't use big shot, the smaller the shot that are serviceable the better.

Don't use a small bore gun, the smaller the bore the more the gun cuts. A bigger bore with a very light charge of shot and powder will get better specimens. You will miss more birds, but it is better to kill one out of five clean than maul four out of five. Thin central wads and thin card wads between the layers of shot ensure a wide pattern, and enable you to kill your specimens clean.

Don't take short clutches of eggs and odd eggs, take a full clutch or leave the eggs alone. Taking short clutches is to spoil the nest and then get eggs that are of little utility, odd eggs are nearly useless since they illustrate so little. Taking a few out of a nest means either desertion, in which case you might as well take the clutch, or rearing a short brood, which is undesirable. Take early clutches and the birds will nest again and rear full broods; if it can be avoided don't take incubated clutches or late clutches. The bird's ovaries have usually then become quiescent, and she will not lay again that year.

Don't handle nests, the birds will desert; if you must, rub your hands in the earth first, it kills the smell of humanity so offensive to the avian world.

Don't waste the contents of your birds' stomachs. If you have the perseverance and patience the contents of a single bird's stomach will often furnish you with material for months of microscopic work. I may say this particular branch of work is much neglected. It is a subject of the highest scientific and economic importance to know what our birds, especially our insectivorous birds eat. You also in doing such work will run a grave risk of distinguishing yourself by the discovery of new and interesting insects. A number of our more minute species have only been met with in the stomachs of insectivorous birds.

From dawn to 8 a.m. is the best time for all bird work. The birds are less on the alert, as they do not expect to be troubled by man at that early hour. Also man will not trouble you by undue curiosity and discussing questions of trespass. Remember the practical ornithologist is looked upon as a pariah. The keeper thinks you want an interminable supply of game birds eggs, the farmer looks upon you as a friend of his worst enemies, and therefore a sworn enemy (in reality the birds are his best friends), the policeman regards you as an easy prey and a possible conviction to help his chances of earning the regard of his superiors as an energetic and efficient officer.

Preservation.

I refer you to Montague Brown, Taxidermy and Modelling, Elliott Coues, Field and General Ornithology, and the B.M. Handbook. I cannot profess to emulate the accuracy and fullness of these writers.

Plenty of napthaline should be kept with the birds, it won't hurt the plumage and keeps out moth and mites. Good white blotting paper is splendid to keep the bottoms of the drawers and trays lined with, as it absorbs grease.

A band of paper to keep the wings up is a good plan. It helps the skin keep its shape.

Deep drawers are best, with air-tight glass lids. In these drawers you can put shallow trays of three-ply or cardboard for the smaller species. Such trays are readily made with a cutting gauge and glue pot and a supply of cigar box pins. Divisions are desirable for the small birds, as it keeps them from rolling about. The B.M. keep their birds in small oblong glass topped cardboard boxes arranged in cabinet drawers, this plan is neat and good, but rather expensive.

Needless to say the same amount of dryness and warmth is required for skins as for insects.

Egg Blowing.

Eggs should be side blown with a single hole of sufficient dimensions, and care taken to extract the membrane round the yolk.

Recording.

A diary is kept similar to the Entomological diary in which we note habits, migratory movements, and all matters of the like nature. This is entered as soon after the observations are made as we can manage, stale records are unprofitable and inaccurate. We aim here, as with the insects, at eliminating that uncertain quantity the human memory as much as possible.

All birds should be measured in the flesh. All measurements should be by the metric system. We keep the following measurements:—Culmen, wing, if necessary stating to which primary measured, tip of bill to tail, tail, tarsus, middle toe and claw,

irides, weight, and colours, all duly entered in the diary. Colours should be noted as early as possible. Mandibles and irides, and the feet in a lesser degree fade rapidly. Birds have not got black beads for eyes as is commonly supposed, the majority have hazel brown irides.

DATA TICKETS.

Every bird should have a label. The least important part of which is the name of the bird. The bird can almost always speak for itself on this point and difficulties of determination are less pronounced in the Aves than in the Insecta. There are fewer species, and except in a few instances they are well marked, they are not subject to distinct seasonal forms, although seasonal changes of plumage occur. On the other hand locality and date are all important. If possible give the contents of the stomach. A serial number is also given to each bird and recorded in the same margin of the diary.

For the sake of convenience we are now instituting a loose leaf record, under which we shall place all the information and references to the bird which we come across, together with all measurements of eggs and birds. This will be in addition to the day to day record in the diary, and will enable us to keep all such notes as we may possess relating to any one bird in one place for direct access.

EGGS.

Remembering what I said about the taking of clutches only, likewise note that cuckoo's eggs should be kept with the clutch of the bird in whose nest the cuckoo deposited its eggs. The egg label should show the following details:—Order, family, subfamily, genus and species, and if you like the trivial name of the bird to which the eggs belong. It should also show on the reverse side of the label the locality whence the eggs came, the name of the collector, date, the clutch mark, the original number of the clutch, the state of incubation, identity, the structure, composition and situation of the nest.

To take these in their order, the locality, the name of the collector and date, do not call for any particular remark after what I said above.

THE CLUTCH MARK.

This should consist of a serial number with any addition you may wish to make. In practice we use a letter for each successive year, and a number, e.g., F. 22, this is the 22nd clutch of the 5th year since we commenced. The only virtue in it is that it prevents the serial number running into more than three figures, as the occasions upon which you are likely to exceed 999 clutches in any one year will be exceedingly rare. Eggs are too delicate to write localities on. All clutch marks to be in waterproof indelible ink.

The original number of clutch should be given, i.e., whether 5, 6, or 20, because one ought then to know the usual number laid

by reference to the original numbers, and by reference likewise one ought to know whether the clutch has become imperfect by breakage.

State of Incubation. Also show about the average number of days the bird usually sits. For instance *T. musicus*, the song thrush. Original clutch number is say 5. The incubation is 5 days or a week, this shows that the thrush commenced sitting when she laid 5 eggs. The result of a number of such entries is to prove conclusively that a given bird never sits less than *X* or more than *Y* eggs.

Identity. One never ought to take a clutch of eggs until one has seen sufficient of the parent birds to be absolutely dead sure of their identity. In fact, the identity blank always ought to be filled by the one entry " certain both parents seen " or " certain female flushed from nest." There may arise cases when you are quite certain that there were a number of birds of that species nesting in a colony with other birds, as *Sterna fluviatilis* and *Larus minutus* do., but cannot be absolutely certain that the nest you have in front of you is that of the bird you think it is, and no matter what pains you take to endeavour to reduce the matter to certainty you are baffled. If you take the eggs you ought to enter under the identity column doubtful nest mixed with nests of so and so and so and so.

Structure and Situation. A short description, say, of a blue tit's nest. In an old woodpecker's nest—in hole 10 feet up an elm tree, nest of moss, lined with horsehair and pheasants feathers, or, as another example, an actual nest of *C. familiaris* I took some time ago. In a split in an old thorn bush, nest of twigs of birch hazel and oak, lined with the dead stems of *Scylla nutans*, the root of *Triticum repens*, dry stalks of *Poa annua*, finished with sheep's wool and feathers of *Phasianus colchicius*, *Columba palumbus*, *Syrnium aluco*, and one feather of *Parus caeruleus*.

Eggs received from strange collections should be syringed with carbolic acid diluted to ensure their sterility.

Arrangement of Eggs.

A series of circles or ovals cut in cards and placed over a thick layer of wadding filling the cabinet drawers is our own system. It looks exceedingly well and is very safe. Next best system is a separate glass bottom or glass top circular box, one for each clutch. Ducks eggs must be accompanied by down from the nest to aid identification. Down should be sterilized before placing it in the cabinet drawers.

As a last word to you. Never forget rare birds are rare. We very seldom see rare birds ourselves. I warn you that more drivel has been written about birds than any other biological subject I am acquainted with. More casual haphazard records of non-existent monstrosities and imaginary rarities mar our records in this subject than probably any other kindred subject. This looseness and unreliability arises from the following causes, amongst others.

Primarily, the use of English names. Make up your minds once and for all to eschew the society of such animals as tinkers, mollymokes, wheeps, whaups, and crockers, and give them their full titles. Beware of the longshoreman who calls *Aegalitis hiaticola* and *Eudromius morinellus* both Dotterels, the country yokel who calls *Fringilla coelebs* and *Phylloscopus rufus* indifferently the Chiff Chaff.

Secondly, every third person poses as a lover of our feathered friends, and rarely knows a blackbird from a ringouzel, but will assure you with the greatest confidence that *Passer domesticus* that has made its nest in a tree is *Passer montanus*, and who records, as I have seen, " flocks of *Passer montanus* observed going N. by W. 100 feet up!"

Thirdly, the best of us may be deceived by the iridiscent play of the sunshine on the plumage of a bird. The glasses (and the more powerful they are the better) are the only safe test.

If you can procure a thoroughly good set of binocular telescopes by a maker like Dallmeyer they are more truthful than the best prisms. Prisms tend to degrade colour. If you have prisms, Zeiss is superior in my experience as to truth of tone, and I have used probably nearly every make of prism glasses of any note. Tone of colour counts for much amongst the warblers, especially in the genus Phylloscopus.

It is this constant terror of the careless observer that makes one fear to accept anything but the dead bird as evidence, and which makes our local avi-faunistic lists read like a catalogue of slaughter. One fears to accept anything but the actual bird.

I have had *Gecinus viridus* reported to me as *Oriolus galbula*, *Saxicola oenanthe* as *Lanius excubitor*, *Phalacrocorax carbo* as *P. graculus*, hence my scepticism.

Once a person starts telling me of very rare birds seen repeatedly I begin to grow suspicious. One does not go out and see storks, crowned cranes, downy woodpeckers, White's thrushes, and Icterine warblers within a few yards of one another. Rare birds do occur, and one gets occasionally records leaving no room for doubt, even without killing the birds. I have local records of *Upupa epops* the Hoopoe that I have perfect faith in, but then the reporting observer was careful to note many things that confirmed his report to me.

Lastly, join the British Orinthological Union, or, at any rate, if you can observe accurately make migration returns to their Committee.

Photo by Dr. Norman, Bath.

Cheddar Gorge.

The Geology of Cheddar Cliffs.

By Dr. William T. Ord, F.G.S., Chairman of the Geological Section.

(An Address delivered in Cheddar Gorge at the excursion of the Society on May 29th, 1912).

MEMBERS of this Society have on two previous occasions visited the Mendips to study their geological structure, namely, in June, 1909, and in June, 1910,* but this is the first occasion when Cheddar, and its magnificent cliffs, have received a visit. The occasion being of some importance, it was thought that a sketch of the origin and formation of this stupendous work of Nature would probably interest many who knew nothing of geology.

The height of the cliffs, shown in plate IV., is 600ft., and the rock of which they are formed is a variety of limestone, known to geologists as the Carboniferous limestone, because it was found in the great period of geological time, which also gave us the Coal Measures. The Mendip Hills consist of five great elongated masses of Carboniferous Limestone, arranged *en échelon*, and running from E.S.E. to W.N.W. The total thickness of this limestone in the Mendip area is 2,000ft., of which only 600ft. are exposed in Cheddar Gorge at the point of observation. Now, limestones differ from other rocks that have been deposited as sediments from mud, or sand, or shingle, in that they have been built up almost entirely by living organisms. It is a stupendous fact that these 2,000ft. of solid limestone rock have been formed particle by particle by the growth, decay, and death of lowly forms of life, which all had this peculiarity, that they formed or lived in, calcareous shells or shelters. To understand how this took place, one must picture this part of England, in that remote period, covered by a moderately deep sea, and enjoying a tropical climate much as is now found in the Pacific. In this sea lived countless myriads of corals, shellfish, sponges, and zoophytes; these were similar, though of different species, to those now existing in tropical seas. All these creatures absorb lime from the sea, and build it into the various forms which compose their shelters or their homes, and these, sinking to the ocean bed, as their owners died, during a long period of time slowly built up the huge thickness of limestone which we see at Cheddar. This building up was partly helped by the corals, which all the time were briskly constructing vast coral reefs, perpetually added to by succeeding generations of corals, as the older ones sank with the ocean bed. For, as this process went on, the sea bottom very slowly sank, so that after some 2,000ft. of sediment of lime fragments had been deposited, the sea depth was probably about the same as at the commencement of the process. But now a change took

* Proceedings Vol. I., p. 51, 67 ; Vol. II., p. 43.

place. The sea bottom began to rise, and, in time, slowly emerged above the waters. This was the first appearance, as dry land, of the Carboniferous Limestone plateau, which presently was to form the Mendip Range. As this upheaval slowly proceeded, the lime debris dried and consolidated, and, partly by pressure and also by chemical changes, became hardened (as long ages passed) into the dense calcareous rock we find comprising the cliffs of Cheddar to-day.

But some may ask what caused this rising up of the sea bottom, and the appearance of the future Mendip Hills as islands in the waters? We may get an idea of this process from the analogy of an orange, the skin of which has puckered up into wrinkles as the pulp shrank from loss of moisture. So, ages ago, the hardened surface of the earth puckered up into ridges, which formed elevated plateaus and sometimes mountain ranges, as the interior diminished in bulk through cooling of its contents. As the future Mendips were so raised up, the sea retreated, and a sea beach formed a fringe around the elevated masses of limestone. This beach would consist of sand and shingle, but also largely of fragments of limestone broken off by waves from the adjacent cliffs. The remains of this beach, now hardened into stone, are formed as a fringe, now lying around the base of the Mendip Hills on the edges of the limestone. It is the next formation in point of time to the Carboniferous period, and is known to geologists as Dolomitic Conglomerate. It can be seen about a mile below Cheddar.

Having now briefly traced the mode of formation and rising up of the limestone, let us inquire how this magnificent gorge was carved. First, we must state that similar gorges are common in limestone formations. There are several others in the Mendips, Burrington Combe is, perhaps, the best known, and though none approach Cheddar in depth and grandeur, they were all formed upon the same plan and by the same natural forces. Each begins as a depression on the top of the limestone plateau at some distance from the edge, and winds gradually down to the base, where it widens out, but retains nearly the same width to near its termination. The descent is usually too steep to have been caused by a surface stream, also the bends in its course are sharp, sometimes at right angles, an effect never produced by surface rivers, which tend to flow in curves.

The next point to observe is the property massive limestone possesses of splitting into huge blocks, known to geologists as "joints." These roughly rectangular masses are split off by fractures occuring at right angles to each other, and perpendicular to the "lines of stratification," which represent the beds or planes in which the strata was originally deposited horizontally at the sea bottom. These joints can be readily detected in many parts of Cheddar Cliffs, but they show better in quarries, and best of all on a frontage of sea-cliffs. Now, these fissures dividing the joints

and " bedding planes "—as geologists call the horizontal dividing lines between the strata—are the results of earth movements and pressures exerted after the rocks had been elevated into dry land. Since then they have been widened and extended by water action, and by frost in severe winters, acting through long ages of geological time. These fissures and joints give us the clue to the formation of the Gorge.

But before this process began the former sea bottom had become dry land, and the future Mendips had appeared for the first time out of the waters. This new land surface was at once attacked by forces, which set to work to alter and modify it. These were the forces of " sub-aerial denudation," or the denudation or eating away of land exposed to the atmosphere, by water—whether as rain, or streams or ice—by wind and by chemical action. When the first rains poured in torrents upon the new land the water began to run off the higher grounds to the lower, and ultimately to the sea. But, owing to the peculiarity of the limestone surface, a curious thing happened, for instead of the water flowing regularly downwards as ordinary streams do, these streams only got so far as the nearest fissure or crevice in the limestone, and, plunging down this, between the joints, disappeared from the surface. And this occurred all over the new land area, the water everywhere tended to leave the surface and continue its course underground. This sudden vanishing of surface waters, streams, and even rivers, into cracks and fissures is a feature common to the drainage of limestone districts. It is going on to-day as it did countless ages ago, before the Cheddar Gorge was formed. A walk over the Mendips will show numbers of these holes, some with water in them, and many now old and dry. These are known as " swallets," or " swallow-holes," and there are hundreds of them, some large and many small, all over the high Mendip plateau. Now, it is to this curious behaviour of water, which is peculiar to limestone districts, that the formation of Cheddar Gorge is due.

To understand this we must trace the process further, and consider what happens after a stream has disappeared into a fissure between the limestone blocks. Where these joints are well shown it can be seen that their bases are formed by a line of bedding or stratification, and the same earth movements that split the joints have loosened these, so that a line of weakness is formed between the two layers of stone. Along this the water soon makes its way in a more or less horizontal direction, until it meets another vertical fissure separating two other joints further down. Into this it will flow, and then again along another bedding plane to a fissure further beyond. In this manner, by a succession of long steps, water finds its way through crevices in the massive rock, until it issues into the light of day, at the base of the limestone cliffs. The re-appearance of such streams can be seen in many places along the bases of the Mendips. We have examples in

the subterranean stream which comes out into the light of day opposite the Lion Rock, at the opening of the Gorge at Cheddar. Similarly, the River Axe issues from the well-known cave at Wookey, near Wells.

So must have occurred the first step in the making of the Gorge. The stream which commenced this great work of Nature began to flow very soon after the upheaval of the Mendips from the old coral sea. It soon made its way through fissures, as has been explained, in the course of what is now the gorge. And now, having established its channel, in the direction which was some day to become so famous, it set to work to widen and enlarge this by a method, for the understanding of which a little knowledge of chemistry is requisite. Most of us know that the atmosphere contains a trace of a gas known as Carbonic Acid. This gas is soluble in water, and hence is absorbed by rain as it falls. Now, water containing Carbonic Acid Gas will slowly dissolve the lime (or carbonate of lime, as it is called) out of limestone, and carry it off in solution. The streams then, in flowing through the fissures and crevices of the limestone, gradually dissolve the stone, much as a lump of sugar dissolves in tea, only very much more slowly. This causes a continuous enlargement and widening the fissures, which, in the course of ages, cause huge masses of rock to become loosened by the water dissolving the surfaces and edges over which it passes. Thus cavities are formed, which gradually enlarge into long caverns, always connected by spaces and fissures through which water flows from one to another in its downward course. Loosened rock masses tend to fall down and partially block up these spaces; but the water at once begins its work of dissolving, loosening, and washing out fragments, and finding its way into fresh crevices, continually weakens and eats away the rock in its subterranean passage. Hence it follows that such limestone hills as the Mendips, in the course of ages, have become honeycombed with underground caves, channels and water passages. Some are now dry, having been deserted by the streams which formed them, which are now flowing at a lower level; others are full of swiftly moving water. Recently some of these have been explored by intrepid investigators, and the course of certain underground streams mapped out in the Mendips, and especially in Yorkshire, where a Society of cave-explorers has been at work for some years. But while this cavern-forming process has been going on for ages underground, the ordinary processes of wind and weather have been slowly dissolving the limestone from above by surface denudation. Hence it sometimes happens that the roof of one of these caverns becomes very much thinned partly from above, and also by dripping water dissolving it from below. So, presently it cracks, the roof gives way, and a portion falls, disclosing the cave and water passages beneath it. Such an opening, once made, is rapidly enlarged. The cave walls and roof speedily break away

and fall inwards, under the influences of water, frost and exposure. Further portions of roof fall in, above and below the first fracture. This process was, doubtless, helped in geological times by earth-movements. Earthquakes then must have been far more frequent and severe than we have ever known them in England. So, by a combination of these processes, the beginning of a gorge was formed. Such a gorge may be described as a chain of lapsed caverns, of which the roofs have fallen in and the debris has been gradually removed and smoothed out by water. The process is, of course, an enormously slow one, and in the case of Cheddar it began in later Carboniferous times and was continued through the vast ages of the Jurassic period. In this district the principal lines of subterranean drainage through fissures and caves seem to have been established for countless centuries, and no further changes seem probable under present conditions. But in the Carboniferous Limestone of Yorkshire, there are gorges where the roof of a section has quite recently fallen, and in one instance a huge gorge can be seen—not so deep as Cheddar, but nearly 100ft. deep—the lower part of which is still arched over by the roof, which has not yet been broken through. In this there are evidences of several super-imposed caves, caused by the stream forsaking one channel for a lower level, forming a lower cave there, and then forsaking that for a third line of drainage lower again. Probably this was the case at Cheddar, the great depth of which suggests such a sequence of events. This is possible because the water always tends to flow in the same direction, owing to the fissures and lines of bedding being usually constant in the same mass of rock. In an old gorge little evidence is left of the successive steps by which the water gradually descended, owing to the sides of the cliffs having been long ago smoothed off by water and frost, hence the original walls of the caverns are seldom preserved.

This, then, is the theory, now accepted by all geologists, as to the wonderful process by which this magnificent chasm has been formed; and that by forces which Nature still employs around us. You may wonder what has become of the stream which in past ages accomplished such notable work. It is beneath the present road, and still flows amongst fissures and channels down the line of the gorge. Probably it is forming other caves, and thousands of years hence there may be a further deepening of Cheddar Gorge by the falling in of the ground we now stand upon. This stream can be heard on a still day rushing underground at a point a little way down the road, and it issues near the lower caverns to form the large pond at the entrance of the village.

It may be of interest if I conclude with a reference to the celebrated stalactite caves. Water flowing through cracks and passages in the limestone soon becomes saturated with dissolved carbonate of lime, and this tends to be deposited on surfaces lower down over which the water flows slowly, or from which it dips. Thus, by gradual deposition of lime, are built up the beautiful

stalagmites seen on the floors of caves, and also the stalactites hanging from their roofs. Sheets of lime are also formed upon surfaces over which a thin stream or film of lime-saturated water flows. Examples of very beautiful forms of these are shown in Cox's and Gough's caves, near the mouth of the gorge. Doubtless many others, yet undiscovered and never yet trodden by human feet, remain hidden in the vast limestone masses of these hills.

These processes are still going on, though, doubtless, less rapidly than in past ages, when, from greater rainfall, far more water flowed than at present. And this brings us out of the mist of geological times, to the human period, when these hills and their ravines were frequented by the savage hunters of the palæolithic age. Their remains have been found in the caves, together with those of animals long since extinct, such as the Mammoth, Bison, Cave Bear, hyæna and others. Hyænas in particular, hunting in packs, drove their quarries over the cliffs, and dragged their mangled remains into the caves to be devoured at their leisure, where their fragmentary bones have been found in great abundance. Lastly, at the close of Roman times, the caves were once more used as refuges by the unfortunate residents of neighbouring villas, who fled to them from the marauding bands of semi-savages. This explains the discovery of a set of Roman household keys, the owner of which, probably, never returned to his luxurious villa, but perished miserably in the rocks, leaving the ashes of his home to be discovered by the modern archæologist, and his lost keys in the cave he had fled to.

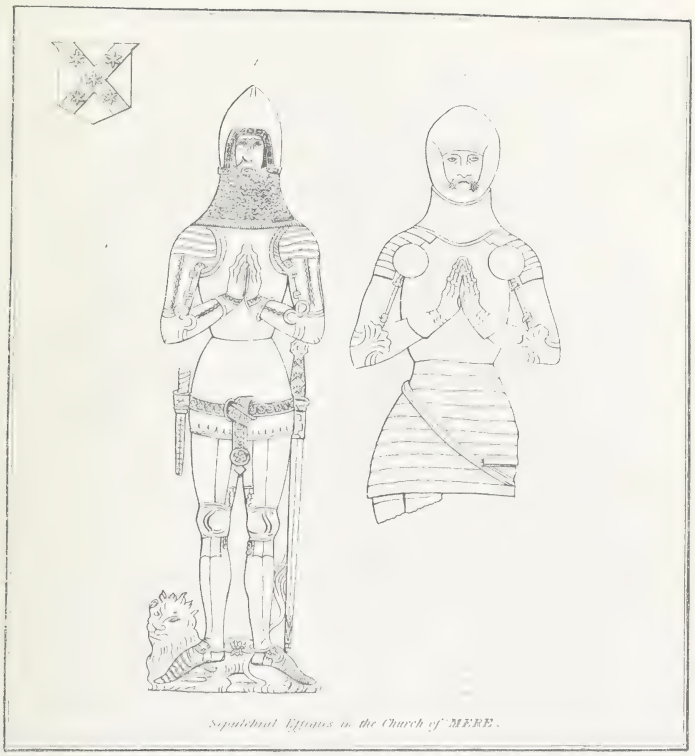
The Berkeleys of Bisterne, etc., Hants: their Homes and their Chauntries.

By G. Brownen, Esq., F.C.S.

An expansion of a Paper read at an Excursion of the Archæological Section, August 7th, 1912.

ON the north side of the choir of the Priory Church of Christchurch, Hants, may be seen the remains of a late 15th Century chauntry, known until recent years as the "William and Margaret" Chauntry, from an imperfect inscription upon its front, the names of its founders being unaccountably lost for centuries since the Reformation.

Neither Warner in the 18th Century; nor Ferry or Walcott in the 19th Century, who accurately describe the chauntry and date its erection, was able to name its founders, even though Christian names were on its façade.



Sepulchral Effigies in the Church of MERE.

Hic iacet Johes Bettesthorne quondam dñus de Chadenisbyrche fundator illius mansure qui obiit vj die Februarii Anno dñi M° CCCXCVIIJ cuj⁹ aīe p[ro]pi[ci]et⁹ deus amē

On qui trāseris: ymāas sup plege plora
Es qđ erum et eris: qđ ñ sp ime p[re]tor ora

1. Sir John Bettesthorne, d. 1398
2. Sir John Berkeley, d. 1427

The founder of this chauntry was Sir William Berkeley, of Beverston Castle (Gloster), and of Avon and Bisterne (Hants) in fulfilment of the terms of the will of his father, Sir Maurice Berkeley, and as one of his executors. This Sir Maurice Berkeley was a knight and landowner in several counties, and owned messuages in the town of Christchurch, and he willed to be buried near kinsfolk in Christchurch Church. By his will, he devised the appropriation of certain rentals, etc., for the erection and sustentation of a new chauntry chapel in the Church of Christchurch Twynham, Co. Southton. With the executors were associated some others, and these executors and feofees were empowered to take the necessary legal steps to found, appropriate and provide for ever a chauntry, to be called " The Berkeley Chauntry," also to allocate such rentals, fines and monies as should pay a priest to pray daily in the said chauntry chapel for the souls of Maurice Berkeley and Dame Anne Berkeley, his wife. To these names were added by Sir William Berkeley, in a codicil (P.P.C. 24 Logge) his own name, that of his wife, Catryn (sic) and all Christian souls. The first burial of a Berkeley in Christchurch Priory seems to have taken place in 1475, but the chauntry, as we shall presently see, is about ten years later in date. A satisfactory explanation of the delay is the fact that a special license was necessary to avoid the penalities of the Act of Mortmain. It happened in times of national discontent and suspicion, King Edward IV. was in his dotage and died shortly afterwards, his son, Edward V., never actually reigned but was murdered in the Tower of London, and his uncle Richard succeeded as Richard III. Sir William Berkeley was a supporter of the murdered Prince, and was, in consequence, attainted by Richard, and he fled across to France. He returned with Henry VII. and was at Bosworth in 1485. As soon as possible after the accession of Henry VII. the legal processes were recommenced to found the Christchurch chauntry, for amongst the State papers of the new dynasty, now at the Record Office in London, is the License for William Berkeley, one of the King's Bodyguard and the son and heir of the late Sir Maurice Berkeley, late one of the King's Council (*i.e.*, Edward IV.), together with his heirs and executors, the right notwithstanding the Law of Mortmain, to allot lands and rentals to the value of ten marks yearly, but not held in chief, to John the Prior and the Convent of Twynham, in the County of Southampton, to find a canon of and in the said Convent to celebrate Divine service daily within a chapel newly built by the said William Berkeley in honour of SS. Mary Magdalen and John Baptist, in which the aforesaid Sir Maurice Berkeley and Anne, his wife, lie buried. Also for the good Estate of King Henry (VII.) and his consort Elizabeth, now King and Queen, and for the petitioners and their souls after their decease, etc. These Letters Patent are dated Westminster, 11th November, 1482. The Prior named in these Letter Patent was John Draper I., the 24th Prior to Twynham, whose priorate extended from 1477 to 1501.

Sir William died of the " sweating sickness " soon after and willed his body to be buried in this chauntry chapel, " where my father lieth" (P.P.C. 24, Logge 1486) and his brother, Sir Edward Berkeley, who is described of Avon, Hants, was subsequently buried in this same chauntry (P.P.C. 4, Adene, 1505). There are, therefore, six Berkeley interments (and probably more) in this Christchurch chauntry. It is a matter of great regret that the present Vicar of Christchurch has seen fit to allow mutilation of the interior of this chauntry, covering up the lower portions of its frescoed walls and by locking the entrance, preventing the historical visitors from seeing the red and white roses of York and Lancaster painted upon its inside roof. An 18th Century local brewer's tablet disfigures the entrance of this most interesting 15th Century chauntry, and is typical of much surrounding vandalism of recent times.

But who were these Berkeley's, and where did they live? They were a junior branch of the ancient House of Berkeley in Gloucestershire, who claim kinship with Viking kings. A younger son of Thomas, 8th Lord Berkeley, named John Berkeley, was not quite out of his teens when his father died. This John Berkeley, of Beverston, when about 33 years of age, married a Hampshire damsel of 17 named Elizabeth Bettsthorne, daughter and sole heiress of Sir John Bettsthorne, of Bisterne and Minstead, Hants, who had estates also in Dorset and Wilts. From natural choice, John and Elizabeth Berkeley lived on their Hampshire estates, and John followed his father-in-law and became Sheriff of Hants in 1402 and 1406, and we may add here to prevent its omission their descendants were Sheriffs on thirteen occasions during the next 150 years. The Bournemouth Society of Natural Science were permitted to see Bisterne House last August by J. Digby Mills, Esq., J.P., its present owner, but, with the exception of the cellarage, the house has been remodelled as well as rebuilt in the 16th and 17th Centuries. The ancient family of Bettsthorne, of Bisterne, whose armorials (made in a later age) are seen over the western doors, were an important family of the 13th and 14th Century. In 1337 a Richard Bettsthorne was elected Prior of Twynham for a few months, a Margaret Bettsthorne appears in the Inquisitions Post Mortems of 1449, and a John Bettsthorne, son of Reginald, is to be found as early as 1248, etc. We are, however, concerned with a later John Bettsthorne, Sheriff of Hampshire in 1378, who died in 1398 and lies buried in his chauntry in Mere Church, Wilts, and his grave is probably covered by an interesting and unique brass (see illustration). In the same chauntry is a fragmentary brass of his son-in-law, Sir John Berkeley, the founder of the house of the Hampshire Berkeleys and buried near his first wife and father-in-law, from whom he derived the estates. Sir John Berkeley lived through some revolutionary times, he saw the deposition of Richard II. and the accession of Henry IV., with its religious

Berkeley and Bettsthorne Badges.

The Berkeley Escutcheon.

Plate VI.

and agrarian troubles. Sir John was a builder at Bisterne in concert with Dr. John Prophete, the last Rector of Ringwood. He built and endowed a chauntry attached to his Bisterne residence about the year 1410, and the vaults under the present Bisterne House may probably be of the same age. The chauntry which stood at the southern end of the house has long since vanished, probably in the Tudor Reformation era, when, we are informed, the curate was a lunatic and the chauntry unserved. Sir John Berkeley died in 1427 and was buried near his first wife at Mere (see illustration), and his son, Sir Maurice Berkeley, the reputed dragon-slayer, who had been made a knight during his father's life, succeeded. Sir Maurice married Laura, daughter of Lord Fitz Hugh, a member of the baronial House of Warwick. This dragon legend, as written nearly three hundred years since (1618), is as follows:—"Sir Morris Barkley, the son of Sir John Barkley, being a man of great strength and courage. In his time there was bred in Hampshire, near Bisterne, a devouring dragon, who, doing much mischief upon men and cattle, could not be destroyed but spoiled many that attempted it, his den was near a beacon. This Sir Morris Barkley, armed and encountered it, and at length killed it, but he died himself soon after." The record in Berkeley Castle assigns the date as 1431. As naturalists, we are not disposed to wholly reject this legend, but would suggest that either a late specimen of some venomous reptile or else some domestic animal, gone mad, would account for the real incident. Where the dragon-slayer was buried is uncertain, but in the chauntry at Mere is a shield with the arms of Bettsthorne quartering Berkeley and impaling Fitz Hugh, which belongs only to this Sir Maurice, it may be that his remains lie near his parents and grandparents. After the death of the first Sir Maurice, his son, another Sir Maurice Berkeley, succeeded to the title and estates. The second Sir Maurice was an attendant and partisan of Edward IV. and married Anne West, a member of the family associated with the erection of the Lady Chapel in Christchurch Priory Church. This fact, and its linkages with the families of Chidcock, Stourton, and West with the Berkeleys is the clue or reason for the erection of the Berkeley chauntry in Christchurch Priory Church. It was this Sir Maurice Berkeley who willed the erection of the chauntry over his grave and that of his wife, as already noticed, in 1474-5, but its erection was delayed until the commencement of the Tudor dynasty by political influences. The last male heirs of this branch of the Berkeley family died early in the 16th century, and parts of the estates became the inheritance of Wyburga Brereton, as the daughter and heiress of Catherine Berkeley. This lady married a Sir William Compton, a courtier in attendance on King Henry VIII. The Bisterne estates thenceforward became the property of the family of Compton until near the end of the 18th Century, when they were sold by Mr. Compton to Mr. Mills, the direct ancestor of the present owner.

Our illustrations show—

Plate V.— The brasses of Sir John Bettsthorne, who died in 1398, and his son-in-law and successor, Sir John Berkeley, who died 1427, now lying in Mere Church, Wilts. The inscriptions below the figures are:—

Hic jacet Johés Bettesthorne quondá dñs de Chadenwyche fundator illius cantorie qui obiit vj die Februarii Anno Dm MCCCXCVIII litera dmcal E cui' aie ppictet Deus amé

Or

Here lieth John Bettsthorne, formerly lord of Chadenwyche, the founder of this Chauntry, who died on the 6th of February, A.D., 1398, the day of the Dominical letter E. On whose soul God have mercy. Amen.

The lower inscription is:—

Tu qui tráneris: videas, Sta, plege, plora
Es qd eram et eris: qd sñ p me pr'cor ora.

Thou passer-by look, stop, lament. Thou art what I was.

Thou shalt be what I am. Pray for me I beseech thee.

The arms of Bettsthorne of Bisterne—five stars on a saltire cross—is on a shield on the plate.

Plate VI.— The arms of Bettsthorne, Berkeley, Compton, etc., with the date 1652, now on the west front of Bisterne House.

Plate VII.—The south front of Bisterne House, showing the Tudor period and style, and the site of the ancient chauntry of the Berkeleys from 1410.

Front view of the Bisterne Chauntry in Christchurch Priory Church.

The Results of Archæological Research during the past Year (1911-12).

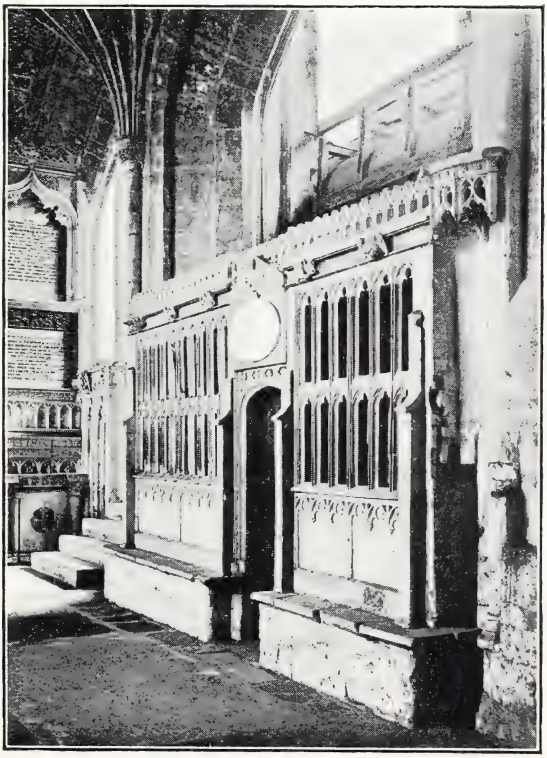
Being the Introductory Address to the Archæological and Historical Section of the Bournemouth Natural Science Society, delivered by the Sectional Chairman,

MR. G. BROWNEN, F.C.S.

at the Society's Rooms, Granville Chambers, on 21st November, 1912.

LADIES and Gentlemen.—It is once more my duty and privilege at this, the first meeting of our new year and its winter session, to review some of the results obtained by explorers and antiquarians since the first meeting of our section in November, 1911. I may say at the outset it has not been an epoch-making

Bisterne House.



Berkeley Chauntry.

or year of brilliant discovery, like some past years, but it may be ranked with those of steady and substantial progress. As in former years, so again, I should like to notice the finds or notices in foreign countries, and from thence return to Britain and close with things of our own locality.

China and Japan, in the Far East, have supplied some curious bone carvings similar to those found in prehistoric Europe— it is stated that these graphic inscriptions rank as amongst the oldest yet found, and a date of not less than 2,000 B.C. may be assigned to them. As one of the results of the great Imperial Durbar at Delhi and in honour of the accession of the new Emperor, King George V., our national collection of Indian coins has been enriched by some most magnificent gifts, and made the finest in existence— as illustrating the ancient history of India, they will be most valuable. From Tibet and Turkestan, those lands of romance in Central Asia, come rumours of discoveries of forgotten cities and races that must await confirmation. The long unrest in Persia has not been favourable to the explorer, but, in Assyria and Babylonia, the American, British and German savants have made interesting finds—such as the Kis tablets of early Assyrian history before the capture of Isin—or, in plain figures, reaching back to the 3rd or 4th millennium B.C. In Palestine, there is still progress made, although the desecration scare of last year proved a myth, yet it became a hindrance—now we are told that the French explorers did not touch the Haram area, but a settlement just beyond its south-eastern corner, at Ophel of prehistoric Jerusalem, of B.C. 2,500 or thereabouts. In Central Palestine, the Palace Temple of Ahab, at Sebaste, or ancient Samaria, has been re-opened, and some amphora handles that may have conveyed wine from Naboth's vineyard, once more brought to light. In Syria proper, the older Hittite Empire has furnished fresh relics of that mighty race, who wore boots and drove their iron chariots from the Euphrates to the Dardanelles, and whose colossal stone figures are covered with inscriptions now being deciphered. In Africa, from Egyptian ruins and deserts, come relics of predynastic times—more remote than Menes of the (so-called) 1st Dynasty, and, near Abydos, Professor Naville thinks he has found the tomb of the historic Osiris. One good result of the miserable war in Tripoli has been the discovery of the ruins of Leptis, the birthplace of the Emperor Severus. As regards South and Central Africa, the Zimbabwe ruins and citadels of Rhodesia are yet undated, although opinions are now more modest, and assign these erections nearer the Christian Era. The two Americas need not detain us long. The Mexican parallels, with Ancient Egypt found in North America and the more mysterious relics undestroyed by the Spaniard on the slopes of the Andes in South America want careful study and collation, and then, perhaps, we may arrive at the startling fact that Phœnician or

Hittite may have crossed the Atlantic centuries before Madog, Cabot or Columbus was born. The greatest European finds, of course, have been near the classic sites, such as Rome, Pompeii, Rimini, Orvieto, and Aquileja. Alesia, near Dijon, that withstood so long Julius Cæsar, has disclosed some of its property left in the ruins by its conqueror. We must now turn to British affairs. A few, but interesting, funeral tablets have been found of the Romano-British period at Corbridge (Corstopitum), York (Eboracum), and other places, etc. Traces of Neolithic man, resembling those of Switzerland are reported from Haddingtonshire, and a skull, upon which opinions somewhat differ, has been discovered in Sussex, etc. Our Somerset and Dorset neighbours have been busy at Maumbury, Glastonbury and other sites. At Old Sarum, Avebury, Caer Gwent, and Uriconium the Society of Antiquaries, in concert with local support, have been making scientific and careful explorations. But, in our own neighbourhood, important suggestions and questionings have also arisen. In the pages of "*The Antiquary*" Mrs. King Warry has suggested Portland as the Ictis of Diodorus, and Mr. Clift, before the Dorset Field Club, proposed to remove the murder of the Saxon King Edward from Corfe to Coryates—both still in Dorset.

Death has thinned the ranks of the Antiquarians during the past year—Miss Toulmin, Dean Kitchin, Professor Skeats, and Messrs. Nicholson and Parker, amongst others, have passed away. May we hope others will arrive to continue the work temporarily arrested by their deaths?

Before closing this brief and imperfect review, we may refer to two matters that more intimately concern this Society and our locality. For some years past the Corporation of Bournemouth have become the owners of a large number of drawings, plans and measurements of the ancients forts and mounds of Dorset. This would seem to indicate that these things were interesting to them because they were just beyond them on the west. But why should the east be neglected?—or, more important still—Why are the old settlements within the Borough ignored or neglected, such as the entrenchments at Moordown and Pokesdown? These are now practically destroyed! But, just outside the Borough boundary, at Hengistbury, still remains an important camp and settlement, which has been privately and superficially examined. Rumour often threatens it and, no doubt, soon it may be modernized, yet, under the shadow of that hill and within the defences of its dykes was an ancient settlement sufficiently important to protect the waterway to Hants, Wilts and Dorset. Was it Bolvelaunio, as asserted by General Pitt Rivers? If so, the key to much of the story of South Britain lies buried so close as to touch, if not actually within, the Bournemouth border. Are Bournemouthians troubled with presbyopia or longsightedness, and cannot see things so near at hand? One sometimes wonders whether the financier and speculative builder

will be allowed, as at Winton, Moordown and Pokesdown, to put " the finishing touch " and smash, destroy or remove the relics of the past at the ancient port of Hengistbury. The Avon is the old riverway to Old Sarum and Stonehenge, while the Stour marks the boundaries of the Brython and Goidel, and runs under numerous prehistoric fortresses. At present a careful, systematic examination at Hengistbury might explain our ancient story—but a few years hence it may be destroyed and lost for ever!

The other matter is the startling alterations in the Priory Church at Christchurch. We gladly assent to the removal of the modern innovations from the transept. The clearance of the 19th Century seats from the Nave is unobjectionable and depends essentially on the convenience of the worshippers, but why should costly marbles displace the old stone floor over which, for centuries, the worshippers have stood or knelt? Why, also, should outside columns be brought, cut and fitted inside the church betwixt modern capitals and bases? Such work leads to deception and unreality, and should not be permitted. A chantry near, in the north Aisle of the Choir, with national emblems of the 15th Century, is locked up from the historical student or teacher. If the state of the north side is bad, that of the south side is much worse—the access to the organ gallery and south triforium has been recently taken wholly away. The liability to danger from fire, used in the argument for a diocesan faculty for the alterations has been ignored and aggravated on this south side. A fire at the Priory House or in the organ gallery would mean the destruction of the whole edifice, because it would be in the central part of the church and now recently rendered more difficult of access. We have appealed for the simple provision of a ladder, if no better way could be found, but appeals are unheeded by the authorities, and we hope the time may soon come when greater intelligence will safeguard these national monuments from the destruction which occurred at Selby and elsewhere.

May we close with a quotation from Professor Babelon?—" Archæology is a modern science of the past century. It has brought to light proofs of extinct commerce and art hitherto unsuspected, which carry us back into periods strictly prehistoric and almost geological. . . . It has discovered the doctrines of extinct religions, and explained the meaning of the stony traces of sites where religious rites have been practised. If an unlimited future lies before us, an illimitable past is closing behind us. Let us labour, therefore, to enlist others to this new enthusiasm, and add to our knowledge and enlarge our programme. We are indebted to our ancestors, let us not repay it by the careless destruction of their monuments or memories which still remain."

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